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NINETEENTH BIENNIAL REPORT

OF THE

STATE ENGINEER

COLORADO

1917-1918

HARVARD UNIVERSITY

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Nineteenth Biennial Report

OF THE

STATE ENGINEER

TO THE

Governor of Colorado

For the Years 1917-1918

DENVER, COLORADO
EAMES BROTHERS, STATE PRINTERS
1919

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LETTER OF TRANSMITTAL

Sir: I have the honor to transmit herewith the Nineteenth Biennial Report of the Office of State Engineer for the two fiscal years ending November 30, 1918.

Very respectfully yours,

ADDISON J. McCUNE,
State Engineer.

To His Excellency,
JULIUS C. GUNTER,
Governor of Colorado.

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LIST OF OFFICIALS IN CHARGE OF WATER DISTRIBUTION

Eugene K. Stimson	June 1881 to April 1883
Edwin S. Nettleton	April 1883 to April 1887
J. Sire Greene	April 1887 to April 1889
James P. Maxwell	April 1889 to April 1893
Charles B. Cramer	April 1893 to April 1895
Horace A. Summer	April 1895 to April 1897
John E. Field	April 1897 to April 1899
Addison J. McCune	April 1899 to April 1903
Louis G. Carpenter	April 1903 to April 1905
Thomas W. Jaycox	April 1905 to April 1909
Charles W. Comstock	April 1909 to April 1913
John E. Field	April 1913 to April 1915
Adelbert A. Weiland	April 1915 to April 1917
Addison J. McCune	April 1915 to April 1919

LIST OF OFFICERS AND EMPLOYEES

State Engineering Department

Addison J. McCune	State Engineer
John R. Wortham	Deputy State Engineer
J. H. Baily	Chief Hydrographer
R. G. Hosea	Hydrographer, Division No. 1
M. N. Grant	Hydrographer, Division No. 2
H. D. Amsley	Hydrographer, Division No. 3
B. T. Chase	Hydrographer, Division No. 5
C. C. Hezmalhalch	Chief Clerk and Draftsman
Ellie H. Rhodes	Filing Clerk
Carol Wells Roberts	Stenographer

IRRIGATION DIVISION ENGINEERS

Div. No. 1	Fillmore Cogswell	Denver
Div. No. 2	Edward R. Chew	Pueblo
Div. No. 3	E. S. Counselor	Alamosa
Div. No. 4	Heman C. Getty	Montrose
Div. No. 5	A. J. Dickson	Glenwood Springs

WATER COMMISSIONERS

Div. No.	Dist. No.	Name	Address
1	1	D. W. McSween	Brush
1	2	James P. Higgins	Brighton
1	3	John L. Armstrong	Fort Collins
1	4	H. H. Kelly	Loveland
1	5	J. A. Lee	Hygiene
1	6	James M. Platt	Boulder
1	7	W. M. Elliott	Golden
1	8	Louis Bertolett	Littleton
1	9	H. S. Rainwater	Morrison
2	10	W. F. Starsmore	Colorado Springs
2	11	D. P. Cook	Salida
2	12	D. S. Jones	Florence
2	13	W. W. Hendershott	Westcliffe
2	14	Joe Burgess	Pueblo
2	15	W. T. Hunter	Rye
2	16	A. S. Willburn	Walsenburg
2	17	F. M. Harsin	Rocky Ford
2	18	Juan A. Mestas	Aguilar
2	19	H. B. Bostick	Hoehne
3	20	Thomas Carr	Del Norte
3	21	W. F. Neff	La Jara
3	22	B. W. Harrison	Manassa
1-2	23	F. E. Lilley	Jefferson
3	14	A. J. Maloney	San Luis
3	25	John L. Charles	Crestone
3	26	S. O. Proffit	Saguache
3	27	James K. Holmes	Saguache
4	28	J. Roy Hicks	Sargents
4	29	F. A. Byrne	Pagosa Springs
4	30	George H. Tyner, Jr.	Durango
4	31	No Commissioner	
4	32	No Commissioner	
4	33	Jerry Griggs	Breen
4	34	T. C. Brittain	Mancos
3	35	Stephen Calkins	Blanca
5	36	No Commissioner	
5	37	Charles Gustafsen	Gypsum
5	38	Charles M. White	Glenwood Springs
5	39	Isam W. Graham	Rifle
4	40	C. H. Luellen	Eckert
4	41	A. J. Baxter	Montrose
4	42	George M. Saunders	Mesa
5	43	E. W. Johnson	Meeker
5	44	Arthur Collom	Axial
5	45	J. L. Herwick	Grand Valley
1	46	Clarence A. Manville	Coalmont

Div. No.	Dist. No.	Name	Address
1	47	Clarence Boston	Walden
1	48	R. E. Moan	Jelm, Wyo.
2	49	No Commissioner	
5	50	No Commissioner	
5	51	Oscar M. Cole	Granby
5	52	Clarence B. Rundell	Sheephorn
5	53	James H. MacFarlane	Yampa
5	54	E. W. Leggett	Baggs, Wyo.
5	55	No Commissioner	
5	56	No Commissioner	
5	57	No Commissioner	
5	58	Alfred Booca	Yampa
4	59	No Commissioner	
4	60	A. M. Browning	Norwood
4	61	W. O. Roberts	Bedrock
4	62	W. O. Brower	Cimarron
4	63	No Commissioner	
1	64	John M. Shea	Atwood
1	65	J. A. Grant	Wray
2	67	H. F. Syp	Lamar
4	68	J. W. Martin	Ridgway
4	69	No Commissioner	
5	70	George F. Newton	De Beque

CHAPTER I

FINANCIAL

Appropriations made by the Twenty-first General Assembly for State Engineer's office:

State Engineer, salary	$ 6,000.00	
Three Deputies, salaries	7,200.00	
Traveling & Contingent, State Engineer and Deputies	2,800.00	
Draftsman, salary	3,000.00	
Chief Hydrographer, salary	3,600.00	
Four Hydrographers, salaries at $125.00 per month	12,000.00	
Hydrographers' expense	4,000.00	
Chief Hydrographer's expense	1,200.00	
Stenographer, salary	2,400.00	
File Clerk, salary	2,400.00	
Incidental expense	3,000.00	
Irrigation Division Engineers' salary—		
Division No. 1	5,000.00	
Division No. 2	5,000.00	
Division No. 3	4,200.00	
Division No. 4	4,200.00	
Division No. 5	4,200.00	
Irrigation Division Engineers' expense	5,000.00	
Total		$75,200.00

BALANCES TURNED BACK TO GENERAL FUND

Deputies, salaries	$ 2,071.50	
Traveling and Contingent	10.72	
Chief Hydrographer, salary	60.00	
Chief Hydrographer, expense	.68	
Draftsman, salary	25.00	
Hydrographers, salaries	288.16	
Hydrographers, expense	1.85	
Incidental expense	66.88	
Stenographer, salary	9.68	
Irrigation Division Engineer No. 1, salary	.04	
Irrigation Division Engineer No. 2, salary	.04	
Irrigation Division Engineer No. 3, salary	850.00	
Irrigation Division Engineer No. 4, salary	360.00	
Irrigation Division Engineer No. 5, salary	1,200.00	
Irrigation Division Engineers' expense	122.03	
Total		5,066.58
Total amount expended during biennial period		$70,133.42
Fees received during biennial period		11,245.89
Net cost of operation		58,887.53

STATE ENGINEER—SALARY

Appropriated		$6,000.00
A. A. Weiland	$1,158.33	
A. J. McCune	4,841.67	
Total	$6,000.00	$6,000.00

DEPUTY STATE ENGINEER—SALARY

Appropriated		$7,200.00
L. E. Bishop	$ 822.00	
Junius W. Johnson	354.00	
John R. Wortham	3,036.00	
R. G. Hosea	375.00	
Robert Follansbee	6.00	
M. C. Hinderlider	48.00	
F. C. Snyder	37.50	
C. C. Hezmalhalch	450.00	
Balance in fund	2,071.50	
	$7,200.00	$7,200.00

TRAVELING AND CONTINGENT EXPENSES, STATE ENGINEER AND DEPUTIES

Appropriated		$2,800.00
A. A. Weiland	$ 379.95	
L. E. Bishop	82.15	
A. J. McCune	596.31	
John R. Wortham	514.93	
M. C. Hinderlider	25.72	
Central Motor Company	337.47	
Motor Filling Station	40.00	
Quinn & McGill	8.35	
Moore Auto Supply and Tire Company	51.31	
Republic Rubber Company	19.89	
Tom Botterill	646.49	
Friedman Rubber Company	61.88	
Denver Tire Service	.50	
Denver & Rio Grande R. R.	24.33	
Balance in fund	10.72	
Total	$2,800.00	$2,800.00

DRAFTSMAN—SALARY

Appropriated		$3,000.00
C. C. Hezmalhalch	$2,975.00	
Balance in fund	25.00	
Total	$3,000.00	$3,000.00

CHIEF HYDROGRAPHER—SALARY

Appropriated		$3,600.00
Thos. Grieve, Jr.	$ 750.00	
J. H. Baily	2,790.00	
Balance in fund	60.00	
Total	$3,600.00	$3,600.00

HYDROGRAPHERS—SALARY

Appropriated		$12,000.00
H. D. Amsley	$ 2,750.00	
J. H. Baily	625.00	
B. T. Chase	2,065.33	
M. N. Grant, Jr.	2,875.00	
R. G. Hosea	1,875.00	
J. M. Kelly	471.51	
C. W. Roberts	300.00	
H. E. Turner	750.00	
Balance in fund	288.16	
Total	$12,000.00	$12,000.00

TRAVELING EXPENSES FOR HYDROGRAPHERS

Appropriated		$4,000.00
B. T. Chase	$1,010.32	
H. D. Amsley	1,502.85	
M. N. Grant, Jr.	395.90	
H. E. Turner	118.13	
J. H. Baily	102.09	
C. C. Hezmalhalch	12.75	
O'Meara Green Motor Company	109.75	
Tritch Hardware Company	115.65	
Republic Rubber Company	30.83	
Friedman Rubber Company	48.90	
Denver Tire Service	130.89	
Motor Filling Station Company	10.00	
Quinn & McGill	7.70	
Denver & Rio Grande R. R. Co.	180.00	
Denver & Salt Lake R. R. Co.	30.00	
Atchison, Topeka & Santa Fe R. R.	106.86	
U. S. Railroad Administration	60.00	
Central Motor Company	25.53	
Balance in fund	1.85	
Total	$4,000.00	$4,000.00

TRAVELING EXPENSES CHIEF HYDROGRAPHER

Appropriated		$1,200.00
Thos. Grieve, Jr.	$ 20.85	
J. H. Baily	1,160.36	
H. D. Amsley	18.11	
Balance in fund	.68	
Total	$1,200.00	$1,200.00

STENOGRAPHIC SERVICES

Appropriated		$2,400.00
Arah Shaw	$ 476.67	
Helene P. Cross	290.32	
Carol Wells Roberts	1,623.33	
Balance in fund	9.68	
Total	$2,400.00	$2,400.00

FILE CLERK—SALARY

Appropriated		$2,400.00
Ellie H. Rhodes	$2,271.51	
J. M. Kelly	128.49	
Total	$2,400.00	$2,400.00

INCIDENTAL EXPENSES

Appropriated		$3,000.00
W. & L. E. Gurley	$ 114.49	
Cardwell Blue Print and Supply Co.	14.50	
Lallie Instrument Company	69.00	
Greeley Poudre Irrigation District	28.60	
M. L. Foss	5.72	
Model Machine Company	64.50	
The Alamosa Empire	6.84	
The Bristol Company	27.29	
Gage Readers' salaries	2,602.18	
Balance in fund	66.88	
Total	$3,000.00	$3,000.00

IRRIGATION DIVISION ENGINEER, DIVISION NO. 1—SALARY

Appropriated		$5,000.00
F. Cogswell	$5,000.00	

IRRIGATION DIVISION ENGINEER, DIVISION NO. 2—SALARY

Appropriated		$5,000.00
E. R. Chew	$5,000.00	

IRRIGATION DIVISION ENGINEER, DIVISION NO. 3—SALARY

Appropriated		$4,200.00
D. A. Norton	$2,125.00	
E. S. Counselor	1,225.00	
Balance in fund	850.00	
Total	$4,200.00	$4,200.00

IRRIGATION DIVISION ENGINEER, DIVISION NO. 4—SALARY

Appropriated		$4,200.00
H. C. Getty	$3,840.00	
Balance in fund	360.00	
Total	$4,200.00	$4,200.00

IRRIGATION DIVISION ENGINEER, DIVISION NO. 5—SALARY

Appropriated		$4,200.00
A. J. Dickson	$3,000.00	
Balance in fund	1,200.00	
Total	$4,200.00	$4,200.00

The salary appropriation for Division Engineers Nos. 3, 4, and 5 was raised from $3,000.00 to $4,200.00, to take effect only in case of reappointment or new appointment to the office, which accounts for the balances in these funds.

IRRIGATION DIVISION ENGINEERS, TRAVELING EXPENSES

Appropriated, Five Engineers—$1,000 each		$5,000.00
F. Cogswell	$ 999.66	
E. R. Chew	1,000.00	
D. A. Norton	673.23	
E. S. Counselor	322.27	
H. C. Getty	999.98	
A. J. Dickson	882.63	
Balance in fund	122.23	
Total	$5,000.00	$5,000.00

DISTRIBUTION OF FEES RECEIVED IN THE STATE ENGINEER'S OFFICE DECEMBER 1, 1916, TO NOVEMBER 30, 1918, INCLUSIVE

Filing claims to water rights	$ 9,630.00
Postage	13.39
Blue Prints	907.00
Certifications	214.00
Sale of current meter note forms	2.00
Gaging	88.50
Filing plans and specifications for reservoir dams	192.00
Inspection of reservoir dams	50.00
Office labor	49.00
Filing of transfer decrees	100.00
Remitted to State Treasurer	$11,245.89

CHAPTER II

A REVIEW OF THE WORK OF THE DEPARTMENT FOR THE BIENNIAL PERIOD AND GENERAL REMARKS

It could not be expected that much new construction would be done or even initiated during the last biennial period, since the whole nation was lending its supreme energies towards winning the war, and Colorado was not behind in that work.

Progress was not stopped entirely, however. The largest amount of work was done by the U. S. Reclamation Service. The manager of the Uncompahgre project reports 20 miles of canals and about 750 structures of various sizes having been built during the period.

The manager of the Grand Valley project reports 236 miles of canals built between July 1, 1916, and November 30, 1918, and during the same period 5,600 structures were completed. Perhaps the most reclamation work of the period outside of the government work has been done in drainage. Construction on drainage districts has been in progress in the Arkansas, Rio Grande, the Uncompahgre, and Grand Valleys, and the results are very encouraging.

While information in detail as to the exact amount of ditch and reservoir work done is not available, it is known to be considerable, but usually in small units.

There were 596 filings for ditch appropriations with an average appropriation of about 7 cubic feet, and 129 reservoir filings with an average appropriation of about 32,100,000 cubic feet capacity. These filings, in the majority of cases, represent actual construction, so that, while there have been no large projects completed or initiated, the small ditches undertaken, or completed, show considerable development in the aggregate.

The reports of the Division Engineers show some increase in the acreage cultivated. Some of the crop statistics and other data were omitted from the Division Engineers' reports for want of space. The original reports are on file in this office and can be examined by any one interested.

Two Carey Act projects were approved during the biennial period, but no construction work has been done on them.

INSPECTION WORK

The State Engineer and deputy spent considerable time during each summer in the field on inspection trips. All of the different drainages were visited, except the White and Bear River Valleys. It is believed that such time was well spent, as it enabled the office to get in closer touch with the people and learn their ideas and wants. It also enables the office to get better acquainted with the work of the Division Engineers and Water Commissioners. Much of the work of reservoir inspection can be done at the same time. Aside from these trips many special trips of inspection of reservoirs and to settle ditch controversies were made.

THE WATER CONSERVATION CAMPAIGN

The report of the Water Conservation Committee of the State Council of Defense is made the subject of a special report. The fact that it devolved upon this office to largely direct the distribution of the water and the great importance of the problem of the more economical use of the irrigation water of the state, justifies giving space to the report.

Much has been written on the subject and much remains to be said, but it is large and important enough to justify a special bulletin. If such a bulletin were prepared it should mainly deal with the problem of how to get the farmer to realize the economic value of a more conservative use of water on crops. The observations made during the campaign of the Conservation Committee lead the writer to the conclusion that, on an average, more than fifty per cent. of the water diverted into the ditches is wasted. By this is meant a waste that can be avoided by more careful distribution. Many of our old irrigators do not believe that they are wasting water; they honestly think they are making the best possible use of it.

If it is true that fifty per cent. of the water is wasted, then the area irrigated can and should be doubled with the water already available, with a consequent doubling of the crop yield. When we say one-half of the irrigating water is wasted, we take the generally accepted duty of water as a standard. But if it were desired to secure the greatest possible results from the water available, regardless of the area of the land covered, the results may be considered wonderful.

We would call attention to an article in the July, 1918, number of the Reclamation Record, by John A. Whidtsoe, President of the University of Utah, on "Relation Between Quantity of Irrigation Water and Quality of Crop Produced." We wish a copy of it could be in the hands of every irrigator in the state. His observations are taken from the investigations by the Utah Agricultural Experiment Station, and in co-operation with the investigations of the U. S. Department of Agriculture, of which Dr. Samuel Fortier is chief. Two quotations are given herewith: the result "When 30 acre inches of water were spread over six instead of over one acre, the total yield of wheat was increased from 48 bushels to 226 bushels, and from 4,500 to 18,000 pounds of straw—that is fourfold." As to sugar beets: "When 30 acre inches are spread over 3 acres there was a much larger net financial return than when the same quantity was spread over more or fewer acres. Similar calculations may be made for all the crops studied.''

It will thus be seen that with proper irrigation practice the area of land reclaimed on our rich plains may yet be increased three and four-fold. We can look forward to such accomplishments when the demand for an increase of food stuffs becomes more insistent.

STATUS OF THE IRRIGATION DISTRICTS

It is well known that the majority of the irrigation districts in the state are in serious financial trouble, which trouble has brought great discredit upon the state.

It is not necessary or proper to give space in this report to a recital of the causes of all the trouble, although it would be interesting history. It is quite customary for those not familiar with the situation to brand all districts that are in trouble as ''Fake Schemes.'' The eastern investor who has not received his interest of course may not be blamed for a feeling that he has been swindled. The truth is, most of the districts have considerable merit. As near as can be determined at present about 1,400,000 acres are included in the districts of the state. About 54,000 acres may be pronounced worthless, about 270,000 acres are prosperous, and districts covering about 1,100,000 acres have more or less merit and are worthy of assistance. The Governor, realizing the great importance of the subject, has appointed a special committee for the purpose of suggesting any amendments for the improvement of the district irrigation laws, and to suggest legislation in aid of districts in financial distress. This committee has prepared a bill providing a commission to last six years, which will be presented at the coming session of the legislature.

If a workable law can be passed by which such a commission can succeed in untangling the troubles of and giving financial aid to the worthy projects, it will be a most important piece of legislation.

THE CLEAR CREEK DAM

The Otero Irrigation District constructed a dam on Clear Creek, a tributary to the Arkansas River. The dam is located near the mouth of the creek and about 2½ miles below the town of Granite, and within a quarter of a mile of the D. & R. G. and Colorado Midland railroads and the Midland trail.

The capacity of the reservoir is about 11,000 acre feet of water. The dam seems to be well constructed, but the outlet has not sufficient capacity to pass, during flood water season, the water belonging to prior appropriators. This has led to much annoyance in the administration of the Arkansas River. It also, in a large part, deprives the district of the benefits of the reservoir, for the reason that when water is available for district storage the space is largely occupied by water belonging to prior appropriators. The dam has an ample concrete spillway at high water line. An extension to this spillway by a wooden flume, about 400 feet in length, was made to carry the water to a safe distance from the dam.

On June 17 this flume began to give way at the lower end and the water was cutting the earth back towards the dam. The caretaker at the dam did not seem to realize the gravity of the situation and reported to the superintendent of the district that it was not serious. The D. & R. G. railroad company thought otherwise and sent an urgent request to this office to give the matter such attention as would insure safety to the structure. At the same time they shipped a force of men to the dam. The State Engineer, upon receipt of the telegram from the railroad official, proceeded immediately to the dam, and on arriving there found the cutting away of the earth was temporarily stopped. After arranging with the Division Engineer of the railroad on the work to be done to make the structure safe, he returned to Denver. The Division Engineer reported next day to this office, by letter, that he believed the structure safe, but before the letter reached the office we were notified by telephone that trouble had begun again. Mr. M. C. Hinderlider was deputized to proceed at once to the site and take such action as seemed best to repair the structure.

The railroad company turned over their force of men to him and the break was made secure for the season, but, of course, the work is only temporary. We have taken up the matter of permanent repairs and also the building of additional outlet capacity to relieve the situation mentioned in the beginning of this article.

The district claims to be bankrupt, but promised faithfully to have the spillway fixed. Nothing has been done to this date.

Space is given here to this matter on account of the seriousness of it. The State Engineer is held responsible by the public for seeing that all reservoirs are kept in proper repair. But here is a case where he is helpless. The owners claim to be financially unable to enlarge the outlet and seem not to realize the seriousness of the break in the spillway and would make no move.

The State Engineer can refuse to permit storage if a dam is not in proper repair, but in this case he is helpless, as the outlet is not large enough to carry through the flow of the stream at flood tide, it being a stream-bed reservoir. The State Engineer has no power to supply men or buy materials for such work and in this case, had the railroad company not furnished the men and material, there might have been great destruction of property and loss of life. It would seem wise for the state to give the State Engineer authority in such extreme cases to employ men and purchase material for such work. In such emergencies there is no time for parley and quick action is necessary.

THE WATER COMMISSIONER PROBLEM

Division Engineers who have to deal directly with water commissioners are most unanimous in recommending a better method of selecting them and another effort at getting the law changed at the coming term of the legislature will be made. So much has been said on the subject in the last twelve or fifteen years that it is useless to discuss it further here.

The water commissioner is really the most important officer of this department, requiring more courage, tact, and judgment than is usually found in the average man. We have a number of faithful and conscientious men in the service, but the time has come when men are needed who, besides having all the qualifications mentioned above, should be good irrigation engineers. Such men cannot be had for the pay now allowed by law. It is true that there are a number of districts in the state having so small an amount of irrigation that there seems, to the taxpayer at least, to be little need of a water commissioner, but surely irrigation has developed to a point that will justify a more scientific administration of the water than we are now getting except in a very few instances. It is hoped that our irrigators will soon see that an intelligent administration means much to them in dollars and cents.

This matter of the distribution of water is discussed at considerable length in connection with the State Engineer's report to the Attorney General relative to the hydrographic work done by this office from the Water Defense Fund. We quote herewith from that report:

> "An attempt to secure a better distribution of irrigation water and at the same time improve and amplify our defense of the Nebraska litigation, is, we hope, to be inaugurated in the spring of 1919.
>
> "This will be along the lines of a plan suggested by Mr. R. G. Hosea, Hydrographer on the South Platte Division, and consists of a co-operative agreement between the State of Colorado, the United States Department of Agriculture, the Colorado-South Platte Water Users' Association, and the Counties of Weld, Morgan, Washington, Logan and Sedgwick.
>
> "The territory to be covered under this co-operative agreement will be that part of the South Platte River in Colorado lying in Water Districts Nos. 1 and 64, i. e., that part of the river from the mouth of the Poudre to the Colorado-Nebraska line.

"It is proposed:

"1. To install an automatic recording gage on the rating flume of every ditch and at certain river stations.

"2. To appoint two district engineers, one for District No. 1 and one for District No. 64, whose headquarters shall be Ft. Morgan and Sterling, respectively, and who shall be qualified irrigation and hydraulic engineers.

"3. That their duties shall consist in taking charge of the automatic gages; in making frequent measurements on all ditches and river stations in their districts (possibly weekly), thereby keeping the rating curves of these ditches and river stations strictly up to date and accurate; in gathering any and all other data in regard to crop statistics, duty of water, losses in transmission of water, evaporation, etc., as may be of value or interest.

"4. That these district engineers shall be appointed water commissioners in their respective districts so a part of their salaries at least shall be borne by the counties in which they serve.

"5. That these engineers shall each appoint a deputy water commisisoner as assistant, whose salary will, as usual, be paid by the counties in which he serves.

"This plan if adopted will give us a great deal of valuable information. It will show definitely by automatic record the amount of return seepage to the river and its yearly increase. It will relieve the State Engineer's office of a large amount of hydrographic work on the lower South Platte, and yet will furnish more accurate records than ever before. It will do away with much of the friction between Districts Nos. 1 and 64, which has always been a source of annoyance and expense.

* * * * * *

"The burden of the expense will be so divided that it will not fall heavily on any one of the co-operating parties."

If this plan is carried out and proves a success, and there is no reason why it should not, the same plan could then be adopted for the Arkansas Valley and other drainages in the state.

THE STATE ENGINEER'S LIBRARY

This office has some 1,500 or more volumes on various subjects, some technical, on irrigation—both hydraulic and legal, and including a complete set of the Colorado reports. Also, government reports, which include water supply papers and weather bureau reports. There is much valuable information in these books and pamphlets, but much of it is not available to the public or even the office force without a catalog. We are therefore cataloging this library, using a general cross-index card system, and indexing in so thorough a manner that not only the books, pamphlets, and bulletins may be found quickly, but also the different articles appearing in these books and pamphlets. Cards have been written for the different articles and filed alphabetically under the bulletin number, if any; the title; the subject under consideration, with subheads; location; and name of author or authors. The bookcases have been numbered by tiers and lettered by sections; every book and pamphlet given a number. Each card bears the section number and letter in which the book may be found, and the number of the book in that section.

For instance:

U. S. G. S. Bulletin No. 184
Oil and Gas Fields of the Western Interior and Northern
Texas Coal Measures, and of the Upper Cretaceous
and Tertiary of the Western Gulf Coast—Adams

will be found under U. S. G. S., and Geological Survey; under Oil, Texas, Coal, Gulf, and Adams. Seven cards have been written and filed alphabetically, each card being marked, in this case, Section 1-A, No. 184—Section A in the first Tier, book marked No. 184.

It is believed with this system any subject treated in any book or pamphlet can be readily found.

HYDROGRAPHIC WORK

The hydrographic work of the period was carried on under the same general plan pursued for several years back and with the same force as was used the previous period. The hydrographers were stationed as before at Alamosa, Pueblo, Denver, and Steamboat Springs.

The data secured on the Grand, Dolores, and San Juan drainages was procured through field work done by Chief Hydrographer Baily and in co-operation with the United States Geological Survey and the State Engineer of New Mexico. Also, in co-operation with the United States Reclamation Service on the Grand River, four stations, the Elk River Irrigation Company, seven stations, and the Colorado Power Company, one station on Boulder Creek.

The total number of gaging stations maintained in the state was 74; maintained wholly by the state, 56; in co-operation with the United States Geological Survey, 18. This is an increase of 15 stations over the last biennial period. Credit is due to Chief Hydrographer J. Harold Baily for obtaining this result. Six new stations were maintained wholly by the state and nine new stations in co-operation with the United States Geological Survey.

Some of the old stations will have to be abandoned, however, unless more funds are secured to put them in proper shape. An effort was made to procure more winter measurements than formerly and 105 winter measurements were made. It is important to have all winter measurements possible for storage purposes, and especially for power development. For the benefit of future storage and for power development a number of new stations should be established in the western and southwestern part of the state, but this cannot be done without more funds for gage readers' salaries and traveling expenses for hydrographers.

Much of the time of the hydrographers is taken up with ditch gaging, there being more and more demand for this work every year, and it will soon require an additional force unless the Division Engineers can so arrange their work as to do more ditch rating.

EXPENDITURES FOR HYDROGRAPHIC WORK FROM THE STATE WATER DEFENSE FUND

This work was done under the direction of the Attorney General. About $6,000 was expended, distributed as follows:

Colorado-Nebraska Litigation	$3,055.67
Colorado-Kansas Litigation	1,931.86
Colorado-Wyoming Litigation	135.87
Rio Grande Drainage	329.55
Miscellaneous on the Western Slope	593.69

A detailed report, including an itemized account of the expenditures, a copy of which is on file in this office, was made to the Attorney General, but it cannot be published in this report for want of space.

Much aid was rendered by the Colorado Water Users' Association of the South Platte, who furnished an automobile for the use of the hydrographer and gave much other financial assistance, enabling this office to accomplish much more than would otherwise have been possible. The Arkansas Valley Ditch Association also co-operated a part of the time by furnishing an automobile for the hydrographer, and other financial aid.

In the expenditure of money from the Water Defense Fund, much assistance and advice was given by the Attorney General, Mr. Hubbard. The data obtained will be very valuable in connection with interstate problems.

We do not wish to close this report without reference to the attitude of the United States Reclamation Service concerning water appropriations in this state. The situation as it stands is well expressed by Attorney General Hubbard in his report to the Governor from which we take the liberty of quoting:

> "In connection with co-operation in Reclamation work, I wish to speak briefly of the attitude of the government relative to the granting of rights of way over the public domain. It is a delicate matter to criticize the government. Colorado appreciates what the Reclamation Service has done in constructing two large systems within its borders, and we are

hoping by co-operation to secure still more aid. But if it obstructs the further development of our intermountain area, it were better for Colorado that the Reclamation Act never had been enacted.

"It seems to me that the government, by preventing such development, is defeating the object which it and all are striving for, *i. e.*, the greatest possible use of the waters of our streams. The importance of the return waters from irrigation is known to all. Colorado being on the crest of the continent, the diversion from her streams will be high up where all the available return waters may be used over and over lower down.

"Also, the topography and geology of the intermountain country is such that all the water diverted will return to the streams except what is taken up by the plants and lost by evaporation.

"There are perhaps 1,500,000 acres in the mountain valleys of our state yet to be reclaimed. While much of this area is in a high altitude, its reclamation is very important to the state, as it is the source of winter feed for the stock that is to graze on the several million acres of grazing lands that lie wholly within this intermountain area.

"These remarks are prompted by a case that has just come to the attention of this office. North Park is backward in irrigation development. Colorado citizens saw possibilities there and, after spending several thousand dollars on preliminary work, they are now balked by reason of having their filings held up at Washington lest their project may interfere with the supply for some government projects some miles down the river. There is surely hydrographic data available to show that the diversion these people want to make in North Park could not possibly interfere with the government projects. Thirteen million acre feet of water leaves the state annually, after our present needs are supplied, which, on account of re-use and by storage, should eventually irrigate as many acres.

"This is a matter of grave importance, and it appears that we should come to some understanding with the government. It seems to me we already have sufficient hydrographic data to show that whatever Colorado can divert onto our intermountain valleys cannot injuriously affect any of the present or proposed projects lower down."

A description of all stations and table of daily discharges at each will be found under chapter 8. Actual measurements have been omitted for lack of space. They are on file in this office and can be consulted at any time. Tables of monthly run-off in acre feet for the most important stations of the state will also be found under this chapter.

The head of the Department wishes to express his appreciation of the fidelity and zeal manifested by every assistant and employee of the office during the entire biennial period. It is only by such hearty co-operation and willingness to do whatever is planned that the best results can be obtained. In the death of Mr. M. N. Grant, Jr., in Division No. 2, which occurred October 25, 1918, the service lost one of its most efficient and faithful assistants.

INTERSTATE DIVERSIONS

While this office is in favor of aiding the reclamation of arid lands wherever situated, our peculiar geographical position compels us to make first use of the water of our streams within our own borders. This applies as well to present as to future necessities and uses, and in order to protect the state and its citizens from encroachments which might prove disastrous to future development, it is necessary for the state officials to act with more than ordinary prudence and caution in all matters involving interstate diversions.

The rights of various claimants upon interstate streams should and doubtless will be settled by interstate compacts between the states, with consent of Congress, as permitted by the Constitution of the United States.

Pending interstate compacts, it is important that Colorado streams should not be burdened with perpetual servitudes which are foreign to Colorado territory and that the waters of this state should not be expropriated for the benefit of foreign territory.

Our Constitution declares that the water of every stream within the state is "the property of the public" or state, and these waters are "dedicated to the use of the people of the state" and not to the use of the people of other states.

The state courts have uniformly held that our streams are for the use of the people of this state, free from external interference and foreign servitudes. That there might be no further question, the Legislature in 1917 passed an act (S. L. 1917, Ch. 151, p 539) modeled after the New Jersey act construed in Hudson County Water Co. vs. McCarter, 70 N. J. Eq. 698, 209 U. S. 349), prohibiting interstate diversions. Any interstate compacts would modify this act, but until such are adopted the State Engineer is bound by the terms of the act.

While we look with favor upon the settlement of interstate problems by compacts, we realize such should only be entered into after thorough consideration of the future possibilities upon each stream involved and no general legislation will suffice, and we suggest that the present Wyoming law may finally prove more of a detriment than protection to Wyoming development.

CHAPTER III

WATER CONSERVATION

Prompted by the necessity of the times and the demands of the government for the farmers to put forth every effort to increase production of food products, and knowing the wasteful methods practiced in irrigation, Pres. Charles A. Lory of the State Agricultural College, as Chairman of the Committee on Food Production, Colorado Council of Defense, issued a call for a meeting at Fort Collins on April 30, 1918, to discuss conservation of irrigation waters. At this meeting a committee, consisting of John E. Field, Engineer State Land Board, Prof. E. B. House of the Agricultural College, and A. J. McCune, State Engineer, was appointed to take charge of a campaign of water conservation throughout the state. This committee was designated as the Water Conservation Committee of the Council of Defense. It met at the State Engineer's office on May 4th and issued the circular which is published herewith. The Chairman, Mr. Field, made a report to the Governor, covering the work of the committee which gives a good outline of what was accomplished, and it also is published herewith. Mr. C. L. Chatfield, an engineer from the Land Board, assisted by Mr. Hosea from this office, had direct charge of the distribution of the water run from Cheesman Lake. Mr. Chatfield has rendered a report to the committee which contains much interesting data relative thereto. There is not room for it in this report, but a copy of it is on file in this office.

CIRCULAR LETTER
WATER CONSERVATION COMMITTEE
of
THE COLORADO COUNCIL OF DEFENSE

May 4, 1918.

Dear Sir: On April 30, President Charles A. Lory, of the State Agricultural College, and the Chairman of the Committee on Food Production, Conservation, and Marketing, of the Colorado Council of Defense, sent a circular letter to water users of the Cache la Poudre Valley, and to others who might be interested, in part as follows:

> "Colorado must increase her agricultural production to meet the war needs for Colorado. To accomplish this, every factor influencing production must be safeguarded. We must have adequate labor, better cultivation, protection against

> losses from insects and from plant diseases, better farm management, and more power machinery. All of these have been considered in outlining the national and state agricultural programs, but one of the most important factors influencing crop production in Colorado has not had the attention its importance deserves. We have taken measures to guard our reservoirs and canal structures, but no conference has been held for planning to make the greatest possible use of our water supply or to safeguard production by eliminating waste in the distribution and in the application of water in irrigation."

The letter then calls for a meeting to discus conservation of irrigation water.

Pursuant to the call, a meeting was held at Fort Collins on April 30, at which meeting Water District No. 3, comprising the Cache la Poudre Valley, formed an association with the object of better conserving and utilizing the irrigation water. At this meeting the desire was expressed to extend this work throughout the state, it being the opinion of those present that great good could be accomplished if proper co-operation could be obtained. Accordingly, a committee was appointed to attempt the organization of other irrigated districts of the state similar to that of the Cache la Poudre. This committee consisted of the State Engineer, A. J. McCune, Edward B. House, Professor of Civil and Irrigation Engineering of the State Agricultural College, and Mr. John E. Field, Engineer of the State Land Board.

The object of the organization is to accomplish all that is possible in the economic, efficient, and full use of the available waters of the state, especially in those districts where there is a scarcity and where the demand, even in normal times, is in excess of the supply. Particular attention should be given to those communities producing crops requiring late water for irrigation. To this end we believe the following are important:

First. As early irrigation as the crops permit, but not in excessive amounts, as it is true that by early irrigation a less amount of water will be needed for the first irrigation, and the crops will materially benefit where the soil is not permitted to become too dry.

Second. The storage of water to its fullest possible extent, and to this end the reservoirs lying higher on the streams should, where practicable, be filled first and kept full and subject to the demands of those to whom it properly belongs, and where a surplus is apparent that the surplus may be disposed of to the best possible advantage in the production of crops.

Third. The running of comparatively large amounts of water in both canals and laterals, reducing the losses from seepage and evaporation. The effective use of the water will require sectioning of canals and the rotation of water between the canals taking water from the same stream.

Fourth. Canals and reservoirs should be put in first-class condition. Much water is wasted annually by the breaking of ditches through neglect and on account of the inadequate devices for properly regulating the flow in the canals.

Fifth. Greater good will come from effective administration on both the river and the canal. The effective administration of the river is in the hands of the water officials, and if they are permitted to exercise some judgment in the matter, good will result. Similarly, effective administration on the canals will result in a better supply to the water users.

Sixth. More care should be exercised by the irrigator himself in distributing his water and closer attention should be given to the same.

Seventh. As large an amount of water as possible should be reserved and held for use on late maturing crops, and as the same conditions will affect us in succeeding years, no water should be wasted that is not actually needed, but should be held for use in the following season.

Eighth. Co-operation among the canals and co-operation among the users under the canals is essential to success. It will be difficult to accomplish much without thorough co-operation among all water users, and it will be necessary to have one controller in each community taking water from a common source.

Ninth. To make the work of the state water officials effective, the demand must come by and through the users. The people must be united in one common purpose. The laws and the decrees must be handled more liberally than heretofore, and users must not insist upon their absolute legal rights, but, generously and patriotically, should forego slight benefits for the larger benefits to the community as a whole. Heretofore there has been a fear on the part of users that any concession would jeopardize their rights and legal standing. It should be understood that in this emergency any concession or action will in no wise prejudice rights nor establish a precedent for the future, after this emergency is passed. Just as it is necessary that the army have one head with dictatorial powers, so it is necessary that each water district have one directing head, who will co-operate with the water officials and make such arrangements regarding the use of water as will accomplish the greatest good. The water officials cannot act other than the laws and decrees direct, unless by common consent of the users.

We, therefore, wish to form an organization in your district similar to the one formed in the Cache la Poudre District.

The proposed organization, we believe, can obtain the consent of the users to pool their interests. To effect the organization, it is proposed to call together representatives of all ditches and reservoirs, the users of water, and all others interested, at which meeting the details and the objects will be explained and discussed. At this meeting it is hoped that each community will form a permanent organization to take charge of this matter. The water commissioners of each district have been requested to call a meeting at the earliest practical moment, and we sincerely hope that the conference may have the benefit of your help in working out such a plan for your district.

Notice will be given by postal and through the press, of the time and place for the meeting.

Yours truly,

JOHN E. FIELD,
A. J. McCUNE,
E. B. HOUSE,

State Committee on Water Conservation.

Kindly extend this invitation to all who will be interested, as we find it impossible to reach every one on direct invitation.

Committee.

JOHN E. FIELD, Chairman.
A. J. McCUNE, State Engineer.
E. B. HOUSE, State Ag. College.

REPORT FOR 1918

WATER CONSERVATION COMMITTEE

COLORADO COUNCIL OF DEFENSE

Denver, Colo., Nov. 8, 1918.

To the Executive Committee,
Colorado Council of Defense.

Gentlemen: In reference to the work of the Water Conservation Committee of the Colorado Council of Defense. There is attached hereto a circular letter sent out by the committee on May 4, 1918, which gives the data concerning its organization and the inception of the work. Under this call meetings were had in practically every district of the state. Professor House visited the western portion of the state, Divisions Nos. 4 and 5, and spent some two weeks in an effort to organize a conserv[illegible]ittee in each district. While several such organizat[illegible]fected in the great majority of cases the work wa[illegible]mmissioner, the water users ap-[illegible] exact objects of the committee and being somewhat fearful of outside interference in their local management of water affairs. It is believed by the Division Engineer of that division, however, that good seed was sown that will bear fruit later on.

State Engineer McCune visited the Grand and Arkansas Valleys, and in the Arkansas Valley met with opposition from people who have an entirely erroneous conception of the objects to be accomplished. This Valley, as you know, has the Arkansas Valley Ditch Association, and it was through this Association that we sought to work. However, local jealousies and a conceit on the part of some of the irrigationists precluded the possibility of forming local associations, as desired. In this district, and on the Western Slope, however, much was accomplished in arousing an interest, and in having delegated to the water commissioners somewhat wide powers and considerable latitude in the distribution of water. An earnest effort was made by the users and the ditch owners to conserve the water supply, and a dissemination of knowledge relative to the probable water supply and the needs of crops was quite beneficial. Also we believe it brought the water users closer together with a better understanding, and perhaps the fear of outside interference drew these people closer together for their own benefit, and resulted in benefit to the crops, so that the true objects of the committee were indirectly accomplished.

In the San Luis Valley Mr. Field held meetings in all of the water districts, and in each of them formed a more or less satisfactory local organization. A strong organization was formed at Moffat, in District No. 25; also at Saguache, in District No. 26. Both of these organizations were active during the season, and by the exchange of water, the larger powers enjoyed by the water commissioners, the earnest effort on the part of all users to conserve the water supply, and the dissemination of knowledge relative to probable supply, and the needs of crops, all tended to a very considerable increase in production. At Conejos an association was formed, and especially during the later season, when the water was somewhat scarce, did good work. However, the water supply in this district was very satisfactory, being augmented by seasonable rains in the mountains. At San Luis, in District No. 24, considerable good was accomplished, and an organization was formed. There is, as you know, the Costilla Estates project, a recent development of very considerable magnitude, and a great deal of new land has been broken up. The old settlers, and especially the Mexican settlers, conceived that their rights were threatened, and local controversies, contentions and threatened suits had precluded proper co-operation. Through the good offices of the committee, however, an arrangement was made at once, whereby the old Mexican rights were to receive water during the daytime and the Costilla Estates project during the night. This resulted in eliminating friction, in a more economical distribution of the water, and a better and more neighborly feeling between the two classes of settlers.

At Monte Vista an association was not formed, but certain influential people were designated to look after the interests of the community. In this case also the fear of outside interference drew the local people closer together, and they co-operated much more satisfactorily than they had theretofore done. In my opinion the crop production was materially increased; how much it is impossible to say, but the spirit of co-operation which was engendered, the recognition of the necessities of the country, and the direction of patriotic spirit toward the production of crops, were beneficial during the year, and, without doubt, will have a beneficial effect for many years to come. This Division, No. 3, is rather backward in development, and is in a period of transition. Reservoirs have recently been built, and the old order of things is changing, so I feel that here we have advanced along the road of scientific use of water a distance which otherwise would have been accomplished only after many years of struggle.

In the South Platte Division the districts were visited by Mr. Field and Mr. McCune. Organizations were effected in nearly all of the districts, and where not formed, power was delegated to the water commissioner, which was sufficient to enable him to distribute the water economically. There was, of course, in the South Platte Valley the same development of the co-operative spirit.

Specifically, however, it is interesting to note what was accomplished in a direct, tangible and individual way. Through the Council of Defense, the Denver Union Water Company was induced to donate 6,000 acre feet of water on the first run of June 6th to 12th, and 4,000 acre feet of water on the second run from July 5th to 10th. During the time that the second Cheesman run was being made, numerous requests were received from the farmers for an additional amount of water, to be used on sugar beets alone, that crop at that time being badly in need of water. Arrangements were therefore made for another short run of water from Lake Cheesman, which started on August 5th, amounting to 300 second feet. This quantity of water was turned down from the Lake for two days, and then discontinued, as heavy rains started that lasted for a period of about two weeks.

At the time of the first Cheesman run, wheat conditions were such that the amount of water available, 6,000 acre feet, was not sufficient to care for more than approximately 50 per cent of the acreage under the Burlington, Henrylyn, and English Highline Systems. It was therefore found necessary to borrow as much as possible from ditches of earlier priority, under which wheat had received one or more applications of water, to assist in taking care of other ditches that were short. The ditches in District No. 8, that were entitled to water at that time, contributed a portion of their decrees almost without exception. Some water was obtained from ditches as far down as the Farmers' and Gardeners', deriving its supply from the Platte River, within the city limits.

The ditches directly benefited by the first run were the Burlington, the Henrylyn System, Lupton Shortline, Buckers, English Highline, Platteville, and Farmers' Independent.

Under ordinary conditions, a certain amount of rainfall is expected and received during the months of May and June. The drought, however, extended beyond the usual period, and the emergency, therefore, was not apparent until it was really too late to secure the maximum benefit to crops from the first run of water. This late rainfall was the reason for the organization of the Water Conservation Committee of the Council of Defense. Plans were necessarily, therefore, hurriedly made, although from the amount and quality of the work accomplished, it was very effective. Due to the shortage of assistance in the distribution of water, it was impossible to secure absolute figures under any of the systems, except the Henrylyn and the Burlington. During the first Cheesman run, 3,100 acres of suffering wheat received one application of water under the Henrylyn District, and 2,000 acres under the Burlington ditch, making a total of 5,000 acres of grain that would have been practically a total loss, had it not been irrigated. Immediately after the application of the first run it was estimated by our representative in the field, that from 50,000 to 60,000 bushels of wheat had been produced that would otherwise have been lost. Mr. Field and his assistant made a trip of especial investigation through this district during the latter part of September, and found that these figures were far too conservative. The general consensus of opinion among the farmers and the officers of the Henrylyn District was that at least 100,000 bushels of wheat had been saved. On this basis it is estimated that 150,000 bushels of wheat were produced under the Henrylyn and Burlington systems alone, of a value of $300,000. The area of the wheat covered in the first run under the balance of the ditches above enumerated, according to the State Engineer's office, is approximately the same as the Burlington and Henrylyn combined. It is therefore reasonable to assume that during the time of the first Cheesman run the water secured from that Lake, and the borrowed water from other priorities, handled under the Council of Defense, was directly responsible for the saving of from 250,000 to 300,000 bushels of grain, valued at from $500,000 to $600,000.

It was found on this trip of investigation in September, that without exception, the farmers throughout the territory were loud in their praise of the work that had been accomplished by the Council of Defense, had no protest whatever to make, except that the water had not been obtained as soon as it should have been to accomplish maximum results, and expressed an earnest desire that the work of the Council be continued. It was expected, prior to the run, that considerable criticism on the part of the farmers would occur in the handling of the water. It was extremely gratifying to note the entire absence of such criticism.

During the first Cheesman run it was apparent that other crops, including small grains, such as barley and oats (wheat substitutes), would be materially benefited by the application of water, which of course was not possible at that time, as there was insufficient water to go round. The second Cheesman run was therefore arranged, and was given in its entirety to the Henrylyn District, during which time a little over 1,200 acres of crop were irrigated, out of 1,500 acres that desired and needed water. Owing to the fact that diversified farm crops, to quite an extent, were covered during this run, it was practically impossible to secure definite figures relating to the saving accomplished. However, from investigation of the District, and inquiry among the farmers, possibly the District was benefited to the extent of $150,000.

The benefit from the third Cheesman run might be said to be negligible, on account of the rainfall.

WORK FOR 1919

The work for 1919 should begin by January 1st, as follows:

1st. Begin to compile data relative to snowfall, and probable supply available for the irrigation season.

2nd. Notify all reservoirs, through the press, and water commissioners, that outlets, embankments, etc., be put in repair, and storage pressed to the utmost; winter water should not be wastefully used for stock purposes, where same could be stored.

3rd. Notify ditch companies to get canals in repair early, and to irrigate as early as practicable where the water would otherwise run to waste.

4th. Warn users to irrigate before crops actually suffer—keep the plants growing.

5th. Ascertain where reservoir water can be obtained by gift, loan or purchase, to be used and distributed as was the Cheesman water of 1918. The city in particular should be urged to donate at least 20,000 acre feet, or for a price, if necessary.

Arrangements should be made for a definite quantity of water as nearly as consistent with the fluctuation in supply, in advance of any probable demand. Through the various ditch organizations, and the field superintendent of the Beet Sugar Company, the crop areas that will require water should be definitely located and tabulated. The water supply available should be allotted to these tracts in sufficient time, so that the farmer may depend upon the amount of water that he is to receive, and make his plans accordingly. This method will produce maximum results and minimum loss. In other words, the farmer will not make his plans for area in crop greater than he can successfully handle.

An analysis of the details of the distribution of the water from Cheesman Lake, in the first and second run, is enlightening. Under the first run the distribution was handled by the State Engineer's office, and by Mr. Chatfield of the State Land Board, who was loaned to the committee for that purpose. The amount of land effectively covered under the first run, and under the supervision of the committee, resulted in an irrigation of 50 per cent more land with the same amount of water as during the second run, when the distribution was under the management of the officers of the ditches. In only two cases were penalties imposed. These two were the result of finding water running to waste from the farms which were supposed to be receiving water from the committee. In one case, the water running to waste was not water furnished by the committee, but the committee assumed that if the farmer wasted his own water, he was either not in need of help, or would act similarly to the water furnished by the committee. In the second case, the waste was due to absence on the part of the land owner, and his entrusting the distribution of water to his help. As the committee had laid down stringent rules relative to waste, as a matter of policy, and as an example, it imposed the penalties mentioned, and as both the men penalized were men of great influence, and men owning considerable land, the moral effect was quite beneficial.

On the whole it is certain that more than a half million bushels resulted from the efforts of the committee; that several thousand tons of beets more were produced; that there was a material increase in oats and barley, and that in general, throughout the state, the production was increased on all crops, and the spirit of thoughtfulness and care in the distribution of water was inaugurated, and the spirit of co-operation received a very great stimulus, so that the results are not of the year 1918 alone, but will affect the future of irrigation in the state materially.

Respectfully submitted,

JOHN E. FIELD, Chairman.

CHAPTER IV

THE DRAINAGE PROBLEM OF COLORADO

A lengthy chapter was prepared by the State Engineer for the Eighteenth Biennial Report, on the drainage problem in Colorado, but it was crowded out for want of space. This chapter included an article by D. G. Miller, Senior Drainage Engineer, Department of Roads and Rural Engineering. Owing to the growing importance of the problem, it is thought advisable to give space in this report for Mr. Miller's article, together with some data obtained by Hydrographer H. D. Amsley, during the years 1917 and 1918.

Owing to the magnitude of the problem in the San Luis Valley, and considering that more work has been done there than in any other part of the state, more space is given to that valley. It is a satisfaction to note that more work has been done in drainage than in irrigation, during the last biennial period. The general government has begun actual construction on a comprehensive plan in the Grand Valley, and there are encouraging prospects that it will soon begin work on a [redacted] scheme already planned for the San Luis Valley, whereby more than [redacted] 700,000 acres will be reclaimed.

Mr. Miller gives a tabulated list of the districts in existence at the close of 1916. Several districts have been formed since that time, but we are unable, at time of issuing this report, to give detailed data concerning all of them. Mr. H. L. Morrison, C.E., of Monte Vista, Colorado, reports the following district in San Luis Valley, not given in Mr. Miller's report:

Waverly District No. 1; organized November, 1917; area, 12,300 acres; est. cost per acre, $12.25; construction work to begin in spring of 1919.

He also reports the following private drainage projects in the valley:

The Norton Drainage project; area, 12,500 acres; cost per acre, $14.56; 73 per cent completed; to be finished in August, 1919.

The George McLean Drainage project; area, in acres, 2,376; cost per acre, $13.86.

This project is completed and in operation.

Several other private drainage systems are either completed, or under way in different parts of the state. The results in most cases, where completed, are quite satisfactory.

Some criticisms have been made on the law as it now stands, and it is expected a bill will be introduced at the coming legislative session to amend it.

DRAINAGE IN COLORADO

by

Dalton G. Miller, Senior Drainage Engineer
Bureau of Public Roads, U. S. Department of Agriculture

Colorado, in common with all other communities in which irrigation is practiced, has a drainage problem. The area of irrigated lands within the state, which at the close of 1915, has become so affected by the rise of ground water as to be suitable for little else than pasture, was not less than 1,000,000 acres. Nearly all of these lands were at one time under cultivation; they aggregate an area equal to nearly 36 per cent of that irrigated at the close of 1909, which is given by the Thirteenth Census as 2,702,032 acres.

Definite movements looking toward the reclamation of many of these water-logged lands have been made in most of the irrigated communities within the state, and, in addition to many individual systems of drainage that have been installed, several drainage districts have been organized under the laws of the state. The following table gives the names of these districts, together with other data:

DRAINAGE DISTRICTS IN COLORADO

Name of Drainage District	Location	Date of voting for organization	Area in acres	Est'd cost per acre	Status May 1, 1916
Hunter	Grand Valley	Mar. 23, 1910	408	$14.69	Bonds unsold. District now in Grand Valley District.
Las Animas Cons.	Arkansas Valley	June 4, 1910	1,800	12.50*†	Completed.
San Luis Valley	San Luis Valley	Oct. 11, 1911	72,000	13.90	Bonds voted for $5.00 per acre for outlet system but not sold.
San Luis Valley	San Luis Valley	Friday following Mar. 6, 1912	9,323	12.00	Bonds voted but unsold.
Carmel	San Luis Valley	Mar. 11, 1912	5,040	11.00*	Completed.
Rio Grande	San Luis Valley	Feb. 27, 1915	30,000	2.00†	Under construction.
Weldon Valley	So. Platte Valley	July 7, 1915	705	14.18	Completed.
Palisade	Grand Valley	Nov. 29, 1915	633	18.97	Under construction.
Grand Valley	Grand Valley	Aug. 19, 1915	49,500	....	Preliminary examinations now being made.
Sterling	So. Platte Valley	....	1,930	27.46	Not legally organized but plans and estimates made.
			171,339		
Deducting area in Hunter District counted twice			408		
Total			170,931		

*Actual costs.

†Outlet system only.

The impression that remains after a study of this table is that the number of districts in which the work has actually been completed, is smaller than it should be, in view of the length of time that some of the districts have been organized. The depressed bond market conditions that have prevailed for the past few years, especially as regards irrigation bonds, have in part been responsible for this backwardness, as has also the fact that drainage is relatively new in the West, and as is the case with nearly all pioneer movements, the efforts expended have been out of proportion to the tangible results attained. Even so, out of the ten districts, construction work either has been completed, or is under way in five. This, after all, is not so bad a showing, and work of this character should progress much more rapidly in the future than it has in the past.

The lands needing drainage are scattered throughout nearly every irrigated section of the state, and represent many conditions of soil and subsoil, but in a very general way they group themselves naturally into six representative classes, with respect to subsoil, which is the chief governing factor in the design of any system of drainage. These subsoils are as follows:

(1) Coarse alluvial sands and gravels, the gravel ranging from the size of a pea, to boulders a foot, or even more, in diameter. These are typified in the San Luis Valley lands, some of the lands on the Western Slope, and some in the Platte River Valley.

(2) Land of which the subsoil is a loam of some type in which either sand or clay may predominate. Most of that irrigated area of the state lying to the north and northeast of Denver comes under this classification, as do some of the lands in all other parts of the state.

(3) Land underlain by more or less porous clays, as found in the Arkansas Valley, east of Pueblo, and elsewhere.

(4) Land underlain by shales, as found on the Western Slope, and in the Arkansas Valley, lying chiefly above Pueblo, but to some extent lower down the Valley.

(5) Land underlain by gravels and very large boulders, of volcanic origin, as found in the Surface Creek section of the state near Cory and Eckert.

(6) Land where the subsoil is a colluvial deposit, as found on the north side of the Grand River, at the base of the Bookcliffs. in the vicinity of Palisade.

Of that land in need of drainage at the present time, perhaps 65 per cent is underlain by alluvial sands and gravels, such as would come under Class (1), while possibly the next three classes would average somewhere near 10 per cent each. Class (5) might represent 4 per cent, and Class (6) not to exceed the remaining 1 per cent. These percentages are based upon a general knowledge of conditions throughout the state, and not upon any carefully compiled statistics.

With regard to water-logging, and alkalinity, the irrigated lands in Colorado are grouped into three classes: (1) Those that are merely water-logged; (2) those that are water-logged and alkalied; (3) those that are alkalied, but not water-logged. These classes have been enumerated in the order of their relative areas, as those that are water-logged without being badly alkalied constitute probably 80 per cent of the 1,000,000 acres, and those that are water-logged and alkalied embrace about 15 per cent, while probably not to exceed 5 per cent of the total 1,000,000 acres might be termed alkalied lands in the true sense. It goes without saying that in some communities these classes overlap in such a manner as would render it impossible, except by long and tedious examinations, to state conclusively the exact acreage that belongs to any one of the above classes. However, for all practical purposes, the percentages as given convey a sufficiently accurate idea as to the relative importance of the three classes.

Lands that are water-logged without being excessively alkalied constitute the major portion of the unproductive irrigated areas of the San Luis, the lower Arkansas, and the South Platte Valleys. From an agricultural standpoint, the reclamation of these lands is simpler than that of the other two classes, as it merely involves the removal of the excess water by drainage, followed by deep tillage and copious irrigations for the first season after the drains are installed.

As the San Luis Valley is representative of this class and also of those lands with the alluvial sand and gravel subsoil, and as the areas in this particular valley needing drainage are so extensive, and the problem, as a community problem, of longer standing than that of any other part of the state, the remainder of this paper will be largely devoted to a discussion of conditions in this particular valley.

THE SAN LUIS VALLEY

The San Luis Valley is about as large as the State of Connecticut, having an area of some 3,000,000 acres. Its greatest dimension, nearly 150 miles, is north and south; while east and west the width of the valley is probably 50 miles, at its widest place. It is variously estimated that the valley contains between 1,250,000 and 1,500 000 acres that are capable of being put under cultivation. According to the last report of the State Engineer, the area cultivated in 1914 was 510,016 acres. This includes 229,227 acres of the native grasses that were under irrigation and 244,378 acres planted to the four principal cultivated crops, which are the small grains, peas, alfalfa, and potatoes. This leaves 36,411 acres given to the cultivation of various other crops.

Including the 229,227 acres now in native grasses, and which are not included in the 1,000,000-acre estimate of lands within the state that are injured by irrigation, it is estimated that there is a total of 850,000 acres in this valley that would be benefited by drainage. As the San Luis Valley is essentially a stock raising community, and since these grass lands give some returns and lend themselves very well to this scheme of agriculture, they will undoubtedly be the last lands in the valley to be drained; because of this they may be excluded from consideration at the present time, leaving, in even figures, 620,000 acres in need of drainage. It may be that 100,000 acres of this area are difficult of irrigation because of their rough topography and their adobe soils. At any rate, as this figure is most certainly liberal, this amount will be deducted from the 620,000 acres, leaving 520,000 acres of land in the San Luis Valley easily irrigated, but now largely non-productive because of lack of drainage. Much of this land had produced large yields of wheat and oats in years past. Some of the earlier cultivated tracts, however, have been abandoned, so far as agriculture is concerned, for as long as 20 years, while every year the cultivation of other lands of the valley is given up as unprofitable.

The knowledge of this situation is not new, since almost everyone in the state at all conversant with farming under irrigation knows of the water-logging of this valley, a condition due to the gradual rise of the groundwater which has taken place year after year since almost the very beginning of irrigation.

The drainage problem of the San Luis Valley is perhaps simpler in nearly every detail than is that of any other body of irrigated land in the West, at all comparable in area. The top soil is mostly a sandy loam, and it is almost universally true that a gravelly subsoil may be reached in the water-logged area at a depth of from 4 to 6 feet. Moreover, the slope of the valley is regular, and excepting through, and immediately contiguous to the trough, ranges 5 to 40 feet, or more, to the mile. However, because of the generally regular topography, and the consequent absence of well defined and continuous sloughs, draws, arroyos, or other natural water courses of any description, community effort through district organization is absolutely essential to the successful reclamation of these lands by drainage. One of the principal reasons for this is that about 650,000 acres of the estimated 850,000 acres of wet land in the valley lie north of the Rio Grande, and of this area at least 600,000 acres have no natural outlet to the river. The construction of an outlet for this northern part of the valley is feasible, while the average acreage costs for the land benefited need be but moderate, and would be relatively almost negligible as an item of expense in the drainage of the lands of the valley, when compared with the cost of the necessary lateral system of any adequate drainage scheme. This is true, notwithstanding the opinion popularly held that the outlet for the north end of the valley is an almost insurmountable obstacle to drainage through district organization.

The logical outlet for those lands north of the Rio Grande is through the lowest part, or trough, of the San Luis Valley. San Luis Creek flows through the upper end of this trough, and water from this creek, during flood stages, finds its way into San Luis Lake. Between the lake and the river any continuous channel that may have existed at any one time has in many places been filled in by wind deposits of sand, so that now there remains but a series of unconnected small lakes and dry depressions. The writer had occasion, during the winter of 1911-1912, to pass upon the feasibility of constructing an outlet through the valley trough below San Luis Lake. In connection with the surveys made and the data collected at that time, it was determined that the most feasible point for an outlet ditch to enter the river is near the center of section 10, T. 36 N., R. 11 E., about 5 miles south of Washington Springs, and just west of the Hansen Bluff. The distance from the south end of San Luis Lake to this point in the Rio Grande is slightly less than 20 miles in a direct line, and by the course of the outlet ditch, as then proposed, is about 22½ miles. The difference in elevation between the ordinary water surface in San Luis Lake—as determined on December 20, 1911—and ordinary high water in the Rio Grande—as determined May 18, 1913—was found to be 10.96 feet. The difference in level between the extreme bottom of the lake and the bed of the river is 4 feet. The difference in level between the ordinary water surface in the lake and the bed of the river is 18 feet. The depth of the lake is quite uniform and mostly ranges between 12 and 14 feet.

From data obtained from the survey, it was estimated that, by taking advantage of such natural watercourses and depressions as occur, a ditch through the lower 19 miles of the trough of the valley could be constructed, with the side slopes of 1½ to 1, and a bottom width of 16 feet, by the removal of but approximately 500,000 cubic yards of earth, or an average per mile of 26,300 cubic yards for the 19 miles. This ditch would have a fall of 0.50 foot per mile, or a trifle less, and with a water depth of 6.0 feet would give a theoretical velocity of flow of 1.5 feet per second, and a capacity of 225 second-feet. It was estimated that a ditch with this capacity would provide an outlet for 75,000 acres, and the discharge from the Carmel Drainage District, as discussed later in this article, has closely verified this conclusion.

Including the cost of excavation, rights-of-way, bridges, engineering, legal expenses and incidentals, it was estimated that this ditch could be constructed at a total cost of $74,000, or in round numbers, $1.00 per acre.

Levels run in the vicinity of the lake indicate that the excavation per mile of outlet would not differ materially as between the lower 19 miles and the upper 3½ miles; and assuming that this be the case, the total for the 22½ miles would be under 600,000 cubic yards. For a ditch of greater capacity, it would, of course, be necessary to increase the bottom width, but the yardage of excavation would increase at a less rate than would the capacity of the ditch, so that, within practical limits, an outlet ditch of any required capacity through that portion of the trough of the San Luis Valley below San Luis Lake is not a serious problem with respect to quantity of material to be excavated, and consequently with respect to cost. For any area in excess of 75,000 acres it is believed that the cost of the outlet proper, through the trough of the valley, need not exceed $100 per acre.

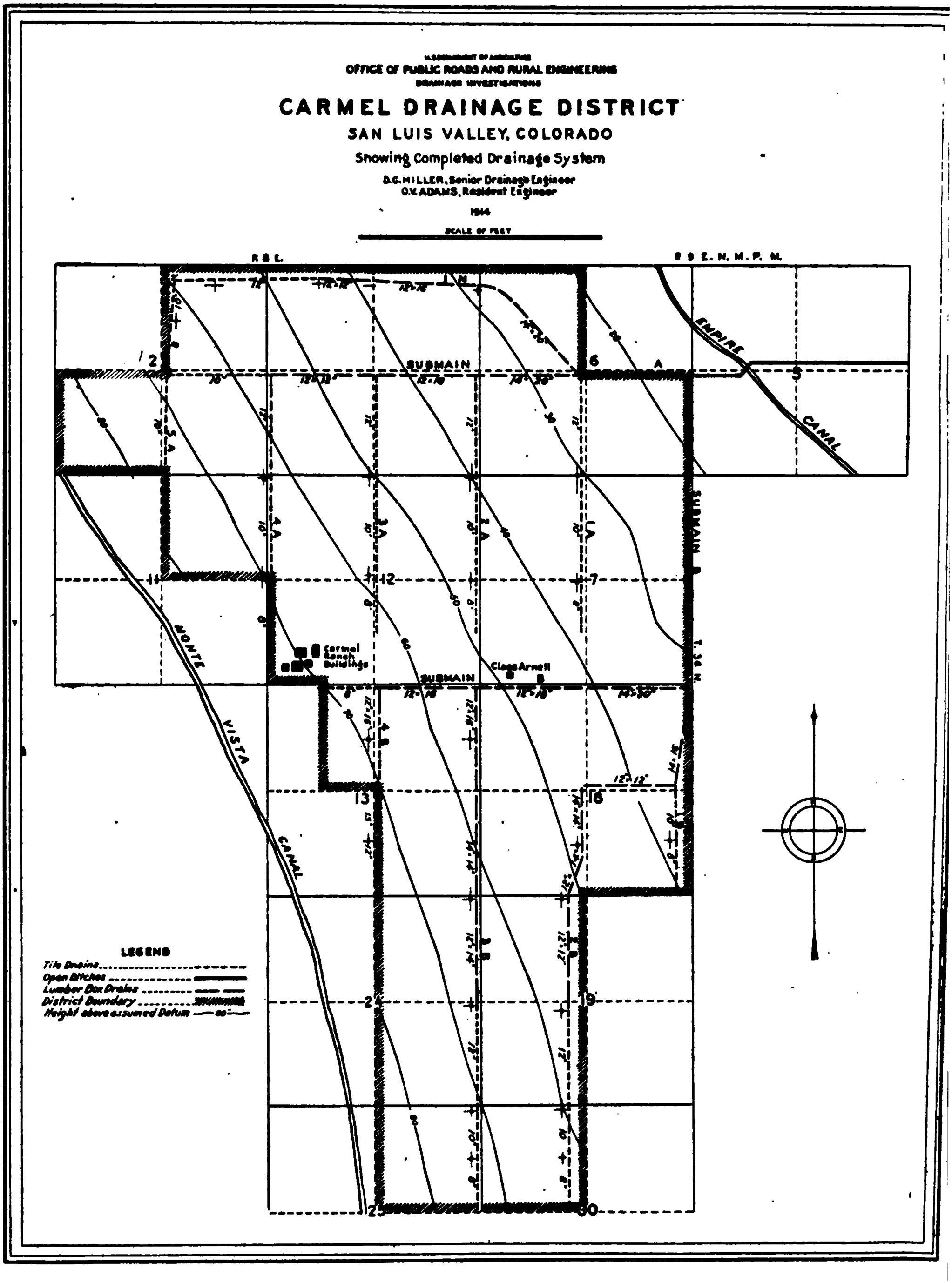
THE CARMEL DRAINAGE DISTRICT

The Carmel Drainage District of 5,040 acres is the only considerable tract of land in the San Luis Valley where a complete system of drainage has been installed. The center of this district is about 20 miles southeast of Monte Vista, 14 miles southwest of Alamosa, and 11 miles northwest of La Jara. The drainage system within the district was installed during the seasons of 1913 and 1914. The writer, as a representative of the U. S. Department of Agriculture, acted as consulting engineer, and Mr. O. V. Adams, of Monte Vista, represented the district, as Engineer and Superintendent of Construction.

The general plan of drainage is indicated on the accompanying map; it is essentially a relief system, as with the drains in the uniformly porous and gravelly substratum but little benefit is to be expected to result from any principle of interception. The drains constructed total 2½ miles of open ditch, and 18¾ miles of covered drains, of which latter 8¼ miles are lumber boxes, and 10½ miles are tile. The effective part of the system consists of the covered drains ½ mile apart, and placed at an average depth between 6½ and 7 feet. The total cost of this system, completed, was $55,000, which included a 5 per cent discount and the first year's interest on the bond issue. In even figures the acreage cost has averaged $11.00. It is estimated that $3,500 was saved to the district by the substitution of lumber boxes for large size tile, so that even had tile been used throughout for the covered drains, the average cost per acre would still have been well under $12.00.

If it may be assumed that the area within this district is typical of those lands in the San Luis Valley that require drainage — or subsequently will — it may be predicted that the cost of installing lateral drains that will effectively reclaim the lands will lie between $10.00 and $15.00 per acre.

Ordinarily the expenses of obtaining an outlet for such water as may be developed within any drained area in the valley will probably be somewhat greater than was the cost in the Carmel District. However, if the districts established be of any considerable size, it is believed that this cost will rarely exceed $1.00 per acre, which is about the figure given earlier in this report for these lands lying north of the Rio Grande. In any event, there is no reason for believing that the total average cost for thorough drainage in the San Luis Valley, under district organizations, need ordinarily exceed $15.00 per acre.



U. S. DEPARTMENT OF AGRICULTURE
OFFICE OF PUBLIC ROADS AND RURAL ENGINEERING
DRAINAGE INVESTIGATIONS

CARMEL DRAINAGE DISTRICT
SAN LUIS VALLEY, COLORADO
Showing Completed Drainage System

D. G. MILLER, Senior Drainage Engineer
O. V. ADAMS, Resident Engineer

1914

The drainage system was completed October 31, 1914; at that time but 1,330 acres of the total 5,040 were under cultivation, the remainder having been wholly abandoned or being used for pasturage of a generally inferior sort. During the season of 1915, after the completion of the drainage system, 1,300 acres additional were cultivated, which represents practically a 100 per cent increase over the acres cultivated the first year. The results have been satisfactory, and even on those lands that for from 10 to 15 years had been too wet for profitable cultivation, good stands of wheat, oats, barley and potatoes prevailed, giving every indication of normal yields another season. No failures were noted last year, but as was to be expected the first year's crops were a little light, the wheat averaging about 15 bushels, and the oats about 25 bushels to the acre. No definite knowledge is at hand as to the acreage that is being cultivated the present season, but it lies somewhere between 3,500 and 4,000 acres.

In the design of a drainage system, it is of primary importance that the approximate volume of water to be carried by the covered drains be closely anticipated, as the drains must be of ample size to be effective at all seasons of the year, and at the same time must not be unduly large, if the system is to be the most economical one that might be designed. To enable the compilation of reliable data to aid in the design of future drainage systems for the San Luis Valley, the discharge at the outlet of the Carmel Drainage District has been rated twice each month since the completion of the system. The following table gives measurements made on the various dates, the mean discharges of each two consecutive measurements, the equivalent mean discharges in acre-feet for the period, the number of days covered by the period, and the total discharge in acre-feet. The drainage system was not completed until October 31, and the ratings as given begin one month later.

DISCHARGE FROM CARMEL DISCHARGE DISTRICT

Date 1914	Discharge Sec. Ft.	Mean Discharge Sec. Ft.	Mean Discharge Acre Ft.	Days	Total Discharge Acre Ft.
Dec. 1	7.27	6.50	12.9	16	206
Dec. 17	5.74	5.60	11.1	16	178
1915					
Jan. 2	5.47	5.05	10.0	16	160
Jan. 18	4.63	4.32	8.6	14	120
Feb. 1	4.02	4.12	8.2	14	115
Feb. 15	4.21	4.81	9.5	17	162
Mar. 4	5.41	5.72	11.3	14	158
Mar. 18	6.03	6.48	12.8	15	192
Apr. 2	6.92	11.21	22.2	18	400
Apr. 20	15.50	13.40	26.6	14	372
May 4	11.30	10.90	21.6	14	302
May 18	10.50	11.62	23.0	11	253
May 29	12.75	13.98	27.7	16	443
June 14	15.21	17.25	34.2	16	547
June 30	19.29	19.00	37.7	15	566
July 15	18.70	19.12	37.9	16	606
July 31	19.54	15.76	31.5	16	504
Aug. 16	11.99	11.57	22.9	14	320
Aug. 30	11.15	11.10	22.0	15	330
Sept. 14	11.04	10.56	20.9	16	334
Sept. 30	10.07	10.75	21.32	16	341
Oct. 16	11.42	11.94	23.7	17	403
Nov. 2	12.46	10.79	21.4	22	471
Nov. 24	9.12	8.20	16.3	19	309
Dec. 13	7.29	6.15	12.0	17	204
Dec. 30	5.02	5.00	9.9	15	148
1915 Total					7,760

During the season of 1914 automatic water registers were placed at two stations in the Monte Vista Canal, one station being above the points of diversion of the water for the Carmel District, and one below. A record was kept of water diverted between these two stations, for purposes other than use within the boundaries of the Carmel District. Limited funds rendered it impossible that the work be done with as great detail and accuracy with respect to rating flumes, frequency of rating, etc., as would have been desired, but the results obtained are probably accurate within a small range of error. It was the date when water was first turned into the Monte Vista Canal, determined from this work, that beginning with May 1, 1915, and continuing through the irrigation season to November 14, 1915, when the water was shut out at the headgate, 10,678 acre-feet were diverted on to the district, and the narrow strip of about 700 acres lying between the upper side of the district and the Monte Vista Canal. This latter area, combined with that within the Carmel Drainage District, totals 5,740 acres, which from the very nature of topographic and physical conditions, thus must be considered as a unit in so far as run-off is concerned.

No rainfall records are available for the Carmel District from January 1 to May 1, 1915, but the amount that fell at Monte Vista for this period totaled 7.00 inches. A standard U. S. Weather Bureau rain gage was placed near the center of the district on May 1, and between that date and December 31, 1915, a total of 2.64 inches of rain was recorded. Assuming that the rainfall conditions at Monte Vista were the same as in the Carmel District for the first four months of 1915, the total amounts to 9.64 inches which is equivalent to 4,609 acre-feet for the 5,740 acres. In addition to the water applied on this area by irrigation and rainfall there are 23 artesian wells that flow continuously on to this same area. These were rated on June 19, and at that time the flows from the 23 wells totaled 0.83 cubic foot per second, which is equivalent to an annual flow of 501 acre-feet. There is, of course, no way of determining the quantity of water that finds its way into the subsoil through defective casings, it may or may not be considerable.

As determined, the quantity of water developed by the three sources—irrigation, rainfall, and artesian wells—totaled 15,779 acre-feet during the year of 1915. During this same period there were discharged at the outlet of the drainage system 7,760 acre-feet of water as indicated by the ratings tabulated. This was nearly 49.2 per cent of the total water applied.

There were uncultivated within the Carmel District 2,420 acres during the 1915 season; subtracting these from the 5,740 acres leaves 3,320 acres upon which 10,678 acre-feet of irrigation water was applied during the same season. On this basis the duty of water was 3.22 feet per acre.

Between May 1 and November 1, 1915, a total of 5,526 acre-feet of water was discharged at the outlet of the drainage system, which with a duty of 3.22 acre-feet per acre was sufficient to have irrigated 1,716 acres of land. This represents an area of nearly 30 per cent of the 5,740 acres, notwithstanding that 2,420 acres of the 5,740 were unirrigated.

To obtain some reliable data as to the quality of the drainage water, samples were collected at the outlet of the drainage system twice each month between December 18, 1914, and January 27, 1916. These samples were later submitted to the U. S. Bureau of Chemistry for analyses. The total salt content for this period averaged 1,092 parts per million and the extremes ranged from 925 parts per million for the sample of June 14, 1915, to 1,368 parts per million for that of October 16, 1915. The results of these two analyses of water samples are given below together with that of the water sample taken July 15, 1915, this latter analysis closely representing the average quality of the water throughout the period investigated.

ANALYSES OF DRAINAGE WATER, CARMEL DRAINAGE DISTRICT

	Milligrams per Liter (Parts per Million)		
Ions—	June 14, 1915	Oct. 16, 1915	July 15, 1915
Sulphuric Acid (SO_4)	542.	742.	572.
Carbonic Acid (CO_2)	14.	6.	0.
Bicarbonic Acid (CO_3)	34.	128.	154.
Nitric Acid (NO_3)	2.	4.	3.
Chlorin (Cl)	63.	78.	64.
Calcium (Ca)	154.	216.	194.
Magnesium (Mg)	37.	21.	38.
Sodium (Na)	79.	173.	80.
	925	1368	1105
Hypothetical Combinations—			
Sodium Nitrate ($NaNO_3$)	3.	5.	4.
Sodium Chloride (NaCl)	106.	129.	106.
Sodium Sulphate (Na_2SO_4)	112.	358.	115.
Sodium Carbonate (Na_2CO_3)	0.	11.	0.
Magnesium Sulphate ($MgSO_4$)	183.	104	188.
Calcium Sulphate ($CaSO_4$)	453.	591	487
Calcium Bicarbonate ($Ca(HCO_3)_2$)	45	170	205
Calcium Carbonate ($CaCO_3$)	23		
	925	1368	1105.

The total quantity of salts in this water is exceptionally small for a drainage water and is not unduly excessive for an irrigation supply. This is especially true in that a study of the analyses shows that of the harmful salts as ordinarily recognized, sodium carbonate or "black alkali" is present in but negligible quantities; while sodium chloride, sodium sulphate, and magnesium sulphate total 409 parts per million in the sample of July 15, 1915, which has been assumed to represent average conditions of this drainage water.

Comparing the quality of this water as a supply for irrigation with that in the Rio Grande at San Marcial, N. M.—as represented by the summary on page 140, U. S. G. S. Water Supply Paper 274 by Herman Stabler—the ratio is found to be only slightly in favor of the Rio Grande water, viz., as 39.5 is to 26.9, while compared with the Grand River water at Palisade, Colorado, the ratio in favor of the drainage water from the Carmel District is as 26.9 to 23.7. It goes without saying that this showing is remarkably good for a drainage water.

It is not within the province of this article to discuss the opportunities for development work within the San Luis Valley offered by the possibilities of using drainage water for irrigating other lands within the same valley. It is perhaps not out of place, however, to remark in closing that, considering the large quantities and the high quality of the water that will be ultimately so developed, the possibilities along this line are most certainly worthy of serious consideration if it may be safely assumed that the Carmel Drainage

District is a criterion for conditions existing generally in the valley.

In conclusion it should be said that while the Carmel Drainage District may be taken to represent conditions as to soil, subsoil and alkali as they exist in something like 50 per cent of the area in Colorado at present needing drainage, it is not to be inferred that the solution of the drainage problem in its entirety throughout the state does not present phases that render adequate relief much more complex and expensive, as such is far from the case. Already many of the small individual tracts in different parts of the state that have been drained have cost from $20 to $50 an acre and upwards. However, judging from such work as has been accomplished along this line, including that of the Carmel District, and considering also estimates for districts that as yet have not been completed, it may be predicted that the drainage of those lands within the state that are at present water-logged can be satisfactorily accomplished, and that under comprehensive district organizations the average acreage cost will range between $15 and $40.

August 9, 1916.

HYDROGRAPHIC DATA OF THE CARMEL AND RIO GRANDE DRAINAGE DISTRICTS

CARMEL DRAINAGE DISTRICT

Records from January 1 to May 31, 1916, were obtained by the office of Public Roads and Rural Engineering, under the direction of Dalton G. Miller, Senior Drainage Engineer. From June 1, 1916, to November 30, 1918, the records were obtained under the direction of Mr. A. A. Weiland and Mr. A. J. McCune, State Engineers.

Discharge measurements were made about 20 days apart and the daily estimates were interpolated directly between measurements.

RIO GRANDE DRAINAGE DISTRICT

This district is situated in Townships 39, 40 and 41 North, Range 8 East of N. M. P. M. The center of the district lies about 9 miles northeast of Monte Vista.

The district embraces 30,000 acres and there are about 4,000 acres not included in the district that will be drained by open ditches of the Rio Grande lateral system.

The system when complete will consist of 15.2 miles of main outlet of which 2.1 miles is covered. The lateral system will consist of 44 miles of covered box drain.

The laterals are placed one mile apart. The depth of the outlet and lateral system varies from 4.5 to 7.0 feet.

This district diverts water from the main outlet into the Prairie Ditch in Section 8, Township 39 North, Range 9 East. This water has been used for the past two seasons with good results.

The following table shows the number of miles of main outlet and covered drains completed for each three months since January 1, 1917:

Date	Main Outlet Open Ditch Miles constructed	Main Outlet Covered Drain Miles constructed	Laterals Covered Drains Miles constructed
January 1, 1917	13.1 complete	0	0
April 1, 1917		0	0
June 1, 1917		1.25	0
October 1, 1917		2.10 complete	0.75
January 1, 1918			0.75
April 1, 1918			1.00
June 1, 1918			7.00
October 1, 1918			13.00

In 1917 two gaging stations were established by the State Engineer's office in the Rio Grande Drainage District.

One station was established in the main outlet in the south half of Section 34, Township 39 North, Range 9 East, about 0.5 mile above the mouth of the outlet. The other station was established in the diversion ditch between the main outlet and the Prairie Ditch in Section 8, Township 39 North, Range 9 East.

Discharge measurements were made about 20 days apart and the daily discharge estimates were interpolated from the measurements, taking into consideration all local conditions which would affect the flow between time of measurements.

The total discharge of the district will be found by adding the daily discharges of the diversion into the Prairie Ditch and the discharge at the station one-half mile above the mouth of the main outlet.

The daily estimates for the Carmel and Rio Grande Districts follow.

Discharge of Carmel Drainage District for 1916

Run off, Acre-feet, 8192.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.0	5.0	5.8	8.1	11.5	13.7	19.4	19.8	14.3	11.5	11.0	8.1
2	5.0	4.9	5.8	8.1	11.7	13.9	19.6	19.6	14.2	11.6	10.9	8.1
3	5.0	4.9	5.9	8.2	11.8	14.1	19.8	19.4	14.1	11.7	10.8	8.1
4	5.0	4.9	6.0	8.2	11.9	14.3	20.0	19.2	14.0	11.8	10.7	8.1
5	5.0	4.9	6.1	8.3	12.0	14.5	20.1	19.1	13.9	11.8	10.6	8.1
6	5.0	4.9	6.1	8.3	12.1	14.7	20.3	18.9	13.8	11.9	10.5	8.1
7	5.0	4.9	6.2	8.3	12.2	14.9	20.5	18.7	13.7	12.0	10.4	8.1
8	5.0	4.8	6.2	8.3	12.3	15.1	20.7	18.5	13.6	12.1	10.4	8.0
9	5.0	4.8	6.3	8.3	12.4	15.3	20.9	18.3	13.5	12.2	10.2	8.0
10	5.0	4.8	6.4	8.2	12.5	15.4	21.0	18.2	13.4	12.3	10.2	8.0
11	5.0	4.8	6.5	8.2	12.6	15.6	21.2	18.0	13.3	12.3	10.0	8.0
12	5.0	4.8	6.5	8.2	12.7	15.8	21.4	17.8	13.2	12.4	10.0	8.0
13	5.0	4.8	6.6	8.2	12.8	16.0	21.6	17.6	13.1	12.5	9.8	8.0
14	5.0	4.8	6.6	8.1	12.9	16.2	21.8	17.4	13.0	12.6	9.8	8.0
15	5.0	4.9	6.7	8.1	13.0	16.4	22.0	17.3	12.9	12.7	9.7	8.0
16	5.0	4.9	6.7	8.1	13.0	16.6	21.9	17.1	12.8	12.8	9.6	8.0
17	5.0	5.0	6.8	8.1	13.1	16.8	21.8	16.9	12.7	12.7	9.5	7.8
18	5.0	5.0	6.8	8.4	13.1	17.0	21.7	16.7	12.6	12.6	9.4	7.8
19	5.0	5.1	6.9	8.7	13.1	17.2	21.5	16.5	12.5	12.5	9.3	7.7
20	5.0	5.2	7.0	9.0	13.2	17.4	21.4	16.4	12.4	12.4	9.2	7.6
21	5.0	5.2	7.1	9.3	13.2	17.5	21.3	16.2	12.3	12.3	9.1	7.5
22	5.0	5.3	7.2	9.6	13.2	17.7	21.1	16.0	12.2	12.2	9.0	7.4
23	5.0	5.4	7.3	9.8	13.3	17.9	20.9	15.8	12.1	12.1	8.9	7.3
24	5.0	5.4	7.4	10.0	13.3	18.1	20.8	15.6	12.0	12.0	8.8	7.2
25	5.0	5.5	7.5	10.2	13.3	18.3	20.7	15.5	11.9	11.8	8.7	7.0
26	5.0	5.5	7.6	10.4	13.4	18.5	20.5	15.3	11.8	11.7	8.6	6.8
27	5.0	5.6	7.7	10.6	13.4	18.7	20.4	15.1	11.7	11.6	8.5	6.6
28	5.0	5.7	7.8	10.9	13.5	18.9	20.3	14.9	11.6	11.5	8.4	6.5
29	5.0	5.7	7.9	11.1	13.5	19.1	20.2	14.7	11.5	11.4	8.3	6.4
30	5.0	......	8.0	11.3	13.5	19.3	20.1	14.5	11.4	11.3	8.2	6.4
31	5.0	......	8.0	......	13.5	......	20.0	14.4	......	11.2	......	6.4
Total	155	147.4	211.4	268.6	397.0	494.9	644.9	529.4	385.5	373.5	288.5	235.1
Mean	5.0	5.1	6.8	9.0	12.8	16.5	20.8	17.1	12.8	12.0	9.6	7.6
Acre-ft	307	294	418	536	787	982	1280	1050	762	738	571	467

Discharge June 1st to October 31st from comparative Hydrograph of 1915-17.

Discharge of Carmel Drainage District for 1917.

Run off, Acre-feet, 8492.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.4	5.7	5.9	6.8	9.0	10.0	25.3	22.1	16.0	12.8	11.7	8.6
2	6.3	5.7	5.9	6.9	9.1	10.0	25.8	21.8	15.9	12.9	11.6	8.5
3	6.3	5.7	6.0	7.0	9.1	10.0	26.2	21.6	15.7	13.0	11.5	8.4
4	6.3	5.7	6.0	7.0	9.2	10.5	26.1	21.3	15.5	13.0	11.4	8.3
5	6.2	5.6	6.0	7.1	9.3	11.0	26.0	21.1	15.3	13.1	11.3	8.2
6	6.2	5.6	6.0	7.1	9.3	11.5	25.9	20.8	15.1	13.2	11.1	8.1
7	6.2	5.6	6.1	7.2	9.4	12.0	25.8	20.5	14.9	13.3	11.0	8.0
8	6.1	5.6	6.1	7.3	9.4	12.5	25.7	20.2	14.8	13.4	11.0	7.9
9	6.1	5.6	6.1	7.4	9.5	13.0	25.6	20.0	14.6	13.5	10.9	7.8
10	6.1	5.6	6.1	7.5	9.6	13.5	25.5	19.7	14.4	13.6	10.8	7.7
11	6.0	5.6	6.2	7.6	9.6	14.1	25.4	19.4	14.2	13.7	10.7	7.6
12	6.0	5.6	6.2	7.7	9.7	14.7	25.3	19.1	14.1	13.7	10.6	7.5
13	6.0	5.6	6.2	7.8	9.7	15.3	25.2	18.8	13.9	13.6	10.5	7.4
14	5.9	5.6	6.2	7.9	9.8	15.9	25.1	18.8	13.7	13.5	10.4	7.3
15	5.9	5.6	6.3	7.9	9.8	16.5	25.0	18.6	13.6	13.4	10.3	7.2
16	5.9	5.6	6.3	8.0	9.9	17.1	25.0	18.5	13.5	13.3	10.2	7.1
17	5.8	5.6	6.3	8.1	9.9	17.7	24.9	18.3	13.5	13.2	10.1	7.0
18	5.8	5.6	6.3	8.1	9.9	18.3	24.8	18.2	13.4	13.1	10.0	6.9
19	5.8	5.6	6.4	8.2	9.9	18.9	24.7	18.0	13.4	13.0	9.9	6.8
20	5.8	5.6	6.4	8.3	9.9	19.5	24.6	17.9	13.3	12.9	9.8	6.7
21	5.8	5.6	6.4	8.3	9.9	20.0	24.5	17.7	13.2	12.8	9.7	6.6
22	5.8	5.6	6.4	8.4	9.9	20.6	24.4	17.6	13.2	12.7	9.6	6.5
23	5.8	5.6	6.5	8.5	9.9	21.1	24.3	17.4	13.1	12.6	9.5	6.4
24	5.8	5.6	6.5	8.5	9.9	21.7	24.1	17.3	13.1	12.5	9.4	6.3
25	5.8	5.7	6.5	8.6	9.9	22.2	23.8	17.2	13.0	12.4	9.3	6.2
26	5.7	5.7	6.5	8.7	9.9	22.8	23.6	17.1	12.9	12.3	9.2	6.1
27	5.7	5.8	6.6	8.7	9.9	23.3	23.3	16.9	12.9	12.2	9.1	6.0
28	5.7	5.8	6.6	8.8	10.0	23.8	23.1	16.7	12.8	12.1	8.9	5.8
29	5.7	......	6.6	8.9	10.0	24.3	22.8	16.6	12.8	12.0	8.8	5.7
30	5.7	......	6.7	8.9	10.0	24.8	22.6	16.4	12.7	11.9	8.7	5.6
31	5.7	......	6.7	......	10.0	......	22.3	16.2	......	11.8	......	5.6
Total	184.3	157.8	195.0	237.2	300.3	506.6	766.7	581.8	418.5	400.5	307.0	219.8
Mean	5.95	5.64	6.29	7.91	9.69	16.9	24.7	18.8	14.0	12.9	10.2	7.09
Acre-ft	366	313	387	471	596	1010	1520	1160	833	793	607	436

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Carmel Drainage District at Main Outlet for 1918.

Run off, Acre-feet, 6713.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5.6	5.2	5.9	8.2	9.2	15.3	19.5	11.3	9.8	9.7	9.4	......
2	5.6	5.2	5.9	8.2	9.4	15.4	19.4	10.9	9.8	9.6	9.4	......
3	5.6	5.2	6.0	8.2	9.6	15.6	19.2	10.5	9.9	9.5	9.5	......
4	5.6	5.2	6.1	8.1	9.8	15.8	19.1	10.1	9.9	9.4	9.6	......
5	5.6	5.2	6.2	8.1	10.0	16.0	18.9	9.7	10.0	9.4	9.7	......
6	5.6	5.1	6.4	8.1	10.2	16.2	18.7	9.4	10.0	9.3	9.7	......
7	5.5	5.1	6.6	8.0	10.4	16.3	18.6	9.0	10.1	9.2	9.8	......
8	5.5	5.1	6.8	8.0	10.6	16.5	18.5	8.5	10.1	9.1	9.9	......
9	5.5	5.1	7.0	8.0	10.8	16.8	18.3	8.0	10.2	9.0	9.9	......
10	5.5	5.1	7.2	8.0	11.0	17.0	18.2	8.0	10.2	9.0	10.0	......
11	5.5	5.1	7.4	8.0	11.2	17.3	18.0	8.1	10.3	8.9	10.0	......
12	5.5	5.2	7.6	8.0	11.4	17.5	17.9	8.2	10.3	8.8	10.1	......
13	5.4	5.2	7.8	7.9	11.6	17.8	17.7	8.3	10.4	8.8	10.1	......
14	5.4	5.2	7.9	7.9	11.8	18.0	17.6	8.4	10.4	8.7	10.0	......
15	5.4	5.3	8.0	7.9	12.0	18.3	17.5	8.5	10.5	8.7	9.9	......
16	5.4	5.3	8.2	7.9	12.2	18.5	17.4	8.6	10.5	8.6	9.8	......
17	5.4	5.4	8.4	7.9	12.4	18.8	17.3	8.7	10.6	8.6	9.7	......
18	5.4	5.4	8.6	7.9	12.6	19.0	16.9	8.8	10.7	8.5	9.6	......
19	5.3	5.4	8.8	7.8	12.8	19.3	16.5	8.9	10.8	8.4	9.5	......
20	5.3	5.5	8.8	7.8	13.0	19.5	16.1	9.0	10.7	8.4	9.4	......
21	5.3	5.5	8.7	7.8	13.2	19.7	15.7	9.1	10.6	8.5	9.3	......
22	5.3	5.6	8.7	7.8	13.4	19.9	15.3	9.2	10.5	8.6	9.2	......
23	5.3	5.6	8.7	7.8	13.6	20.1	14.9	9.3	10.4	8.6	9.1	......
24	5.3	5.6	8.6	7.8	13.8	20.3	14.5	9.4	10.3	8.7	9.0	......
25	5.3	5.7	8.6	8.0	14.0	20.4	14.1	9.5	10.2	8.8	8.9	......
26	5.2	5.7	8.5	8.2	14.2	20.3	13.7	9.5	10.1	8.9	8.8	......
27	5.2	5.8	8.5	8.4	14.4	20.1	13.3	9.6	10.1	9.0	8.7	......
28	5.2	5.8	8.4	8.6	14.6	20.0	12.9	9.6	10.0	9.1	8.6	......
29	5.2	......	8.4	8.8	14.8	19.8	12.5	9.7	9.9	9.2	8.5	......
30	5.2	......	8.3	9.0	15.0	19.7	12.1	9.7	9.8	9.3	8.4	......
31	5.2	......	8.3	......	15.2	......	11.7	9.7	......	9.3	......	......
Total	167.3	149.8	239.3	242.1	378.2	545.2	512.0	285.2	307.1	277.6	283.5	......
Mean	5.4	5.4	7.7	8.1	12.2	18.2	16.5	9.2	10.2	9.0	9.4	......
Acre-ft	332	300	474	482	750	1080	1010	566	607	553	559	......

Discharge of Rio Grande Drainage District at Main Outlet for 1917.

S½ Sec. 34, T. 39 N., R. 9 E.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	25.0	40.3	14.2	5.6	5.3	5.4	14.0
2	......	......	......	......	......	25.2	40.1	14.0	5.6	5.4	5.4	13.8
3	......	......	......	......	......	25.4	39.9	13.8	5.6	5.4	5.4	13.7
4	......	......	......	......	......	25.7	39.7	13.6	5.6	5.5	5.3	13 5
5	......	......	......	......	......	26.0	39.5	13.4	5.6	5.5	5.3	13.4
6	......	......	......	......	......	26.7	39.3	13.2	5.5	5.6	5.2	13.2
7	......	......	......	......	......	27.4	39.1	13.1	5.5	5.6	5.2	13.1
8	......	......	......	......	......	28.1	38.9	13.0	5.5	5.7	5.1	12.9
9	......	......	......	......	......	28.8	38.7	12.7	5.5	5.7	5.1	12.8
10	......	......	......	......	......	29.5	38.5	12.3	5.5	5.8	18.7	12.7
11	......	......	......	......	......	30.2	38.3	12.0	5.4	5.8	18.5	12.5
12	......	......	......	......	......	30.9	38.1	11.6	5.4	5.9	18.2	12.4
13	......	......	......	......	......	31.6	37.9	11.3	5.4	5.9	17.9	12.2
14	......	......	......	......	......	32.3	37.7	10.9	5.4	6.0	17.7	12.0
15	......	......	......	......	......	33.0	37.5	10.6	5.3	6.0	17.4	11.8
16	......	......	......	......	......	33.7	37.3	10.2	5.3	6.1	17.2	11.7
17	......	......	......	......	......	34.4	37.1	9.8	5.3	6.1	16.9	11.6
18	......	......	......	......	......	35.1	36.9	9.5	5.2	6.2	16.7	11.5
19	......	......	......	......	......	35.8	36.7	9.2	5.2	6.1	16.4	11.4
20	......	......	......	......	......	36.5	36.5	8.8	5.2	6.0	16.2	11.3
21	......	......	......	......	......	37.2	36.3	8.5	5.1	5.9	15.9	11.2
22	......	......	......	......	......	37.9	36.1	8.1	5.1	5.8	15.7	11.1
23	......	......	......	......	......	38.6	35.9	7.8	5.1	5.7	15.4	11.0
24	......	......	......	......	......	39.3	35.7	7.5	5.0	5.7	15.2	10.9
25	......	......	......	......	......	40.0	35.5	7.2	5.0	5.6	15.0	10.8
26	......	......	......	......	......	40.6	35.3	6.9	5.1	5.6	14.8	10.7
27	......	......	......	......	......	41.1	35.1	6.6	5.1	5.6	14.6	10.6
28	......	......	......	......	......	40.9	34.8	6.3	5.2	5.5	14.4	10.5
29	......	......	......	......	......	40.7	14.8	6.0	5.2	5.5	14.2	10.4
30	......	......	......	......	......	40.5	14.6	5.8	5.3	5.5	14.1	10.3
31	......	......	......	......	......	......	14.4	5.7	......	5.5	......	10.2
Total	......	......	......	......	......	998.1	1096.5	313.6	159.8	177.5	388.5	369.2
Mean	......	......	......	......	......	33.3	35.4	10.1	5.3	5.7	13.0	11.9
Acre-ft	......	......	......	......	......	1980	2180	621	315	350	774	732

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Rio Grande Drainage District, Main Outlet, for 1918.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10.1	7.6	5.6	4.2	5.6	16.4	20.4	9.9	4.7	6.5	17.6	......
2	10.0	7.6	5.4	4.2	5.6	16.8	20.0	9.5	4.8	6.6	17.7	......
3	9.9	7.6	6.7	4.3	5.6	17.2	19.7	9.0	4.8	6.6	17.7	......
4	9.8	7.6	8.1	4.4	5.7	17.6	19.4	8.7	4.8	6.7	17.8	......
5	9.7	7.7	7.8	4.5	5.7	18.0	19.0	8.4	4.8	6.7	17.8	......
6	9.6	7.7	7.5	4.5	5.8	18.4	18.7	8.1	4.9	6.8	17.9	......
7	9.5	7.7	7.3	4.6	5.9	18.8	18.4	7.8	4.9	6.8	17.9	......
8	9.4	7.7	7.5	4.7	6.0	19.2	18.0	7.5	4.9	6.9	18.0	......
9	9.3	7.8	7.6	4.8	7.1	19.6	17.6	7.2	5.0	6.9	18.0	......
10	9.2	7.8	7.8	4.8	8.2	20.0	17.2	7.0	5.0	7.0	18.1	......
11	9.1	7.8	7.9	4.8	9.3	20.4	16.8	6.7	5.0	7.0	18.1	......
12	9.0	7.9	8.1	4.9	10.4	20.8	16.5	6.4	5.1	6.9	18.2	......
13	8.9	7.9	8.2	4.9	11.5	21.2	16.2	6.1	5.1	6.9	18.2	......
14	8.8	7.9	8.4	4.9	12.6	21.6	15.9	5.9	5.2	6.9	18.3	......
15	8.7	8.0	8.5	5.0	13.7	22.0	15.6	5.7	5.3	6.8	18.3	......
16	8.6	8.0	8.7	5.0	14.8	22.4	15.3	5.5	5.4	6.8	18.4	......
17	8.5	8.0	8.8	5.0	15.9	22.8	15.0	5.3	5.5	6.8	18.4	......
18	8.4	7.8	9.0	5.1	17.0	23.3	14.6	5.1	5.6	6.7	18.5	......
19	8.2	7.6	9.1	5.1	18.0	23.8	14.3	4.9	5.7	6.7	18.6	......
20	8.0	7.4	9.2	5.1	19.0	24.2	14.0	4.7	5.8	6.7	18.7	......
21	7.8	7.2	9.4	5.2	20.0	23.9	13.6	4.4	5.9	18.1	18.7	......
22	7.6	7.0	9.5	5.2	20.9	23.5	13.3	4.4	6.0	18.1	18.8	......
23	7.4	6.8	3.7	5.2	20.9	23.2	13.0	4.5	6.1	18.0	18.8	......
24	7.4	6.6	3.8	5.3	13.2	22.8	12.6	4.5	6.2	18.0	18.9	......
25	7.4	6.4	3.8	5.3	13.6	22.5	12.3	4.5	6.2	17.9	18.9	......
26	7.4	6.2	3.9	5.4	14.0	22.1	12.0	4.6	6.3	17.9	19.0	......
27	7.5	6.0	3.9	5.4	14.4	21.7	11.6	4.6	6.3	17.8	19.0	......
28	7.5	5.8	4.0	5.5	14.8	21.4	11.3	4.6	6.4	17.8	19.0	......
29	7.5	......	4.0	5.5	15.2	21.0	11.0	4.7	6.4	17.7	19.0	......
30	7.5	......	4.1	5.5	15.6	20.7	10.6	4.7	6.5	17.7	19.0	......
31	7.5	......	4.1	......	16.0	......	10.3	4.7	......	17.6		......
Total	265.2	207.1	211.4	148.3	382.0	627.3	474.2	189.6	164.6	332.3	551.3	......
Mean	8.6	7.4	6.8	4.9	12.3	20.9	15.3	6.1	5.5	10.7	18.4	......
Acre-ft.	529	411	418	292	756	1240	941	375	327	658	1090	......

Discharge of Rio Grande Drainage District, Diversion Into Prairie Ditch, at SW¼ of NE¼ Sec. 8, T. 39 N., R. 9 E., for 1917.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	......	......	19.8	19.4	16.2	16.3	......
2	......	......	......	......	......	......	......	19.8	19.4	16.4	16.1	......
3	......	......	......	......	......	......	......	19.8	19.4	16.6	15.9	......
4	......	......	......	......	......	......	......	19.8	19.2	16.8	15.7	......
5	......	......	......	......	......	......	......	19.8	19.0	17.0	15.5	......
6	......	......	......	......	......	......	......	19.8	18.8	17.2	15.3	......
7	......	......	......	......	......	......	......	19.8	18.6	17.4	15.1	......
8	......	......	......	......	......	......	......	19.8	18.4	17.6	14.9	......
9	......	......	......	......	......	......	......	19.8	18.2	17.8	14.8	......
10	......	......	......	......	......	......	......	19.8	18.0	18.0	1.0	......
11	......	......	......	......	......	......	......	19.8	17.8	18.2	1.0	......
12	......	......	......	......	......	......	......	19.7	17.6	18.4	1.0	......
13	......	......	......	......	......	......	......	19.7	17.4	18.6	1.0	......
14	......	......	......	......	......	......	......	19.7	17.2	18.7	1.0	......
15	......	......	......	......	......	......	......	19.7	17.0	18.8	1.0	......
16	......	......	......	......	......	......	......	19.7	16.8	18.9	1.0	......
17	......	......	......	......	......	......	......	19.7	16.6	19.0	1.0	......
18	......	......	......	......	......	......	......	19.6	16.4	19.1	1.0	......
19	......	......	......	......	......	......	......	19.6	16.2	18.9	1.0	......
20	......	......	......	......	......	......	......	19.6	16.0	18.7	1.0	......
21	......	......	......	......	......	......	......	19.6	15.8	18.5	1.0	......
22	......	......	......	......	......	......	......	19.6	15.6	18.3	1.0	......
23	......	......	......	......	......	......	......	19.6	15.4	18.1	1.0	......
24	......	......	......	......	......	......	......	19.5	15.1	17.9	1.0	......
25	......	......	......	......	......	......	......	19.5	15.2	17.7	1.0	......
26	......	......	......	......	......	......	......	19.5	15.3	17.5	1.0	......
27	......	......	......	......	......	......	......	19.5	15.4	17.3	1.0	......
28	......	......	......	......	......	......	......	19.5	15.6	17.1	1.0	......
29	......	......	......	......	......	......	19.8	19.5	15.8	16.9	1.0	......
30	......	......	......	......	......	......	19.8	19.4	15.0	16.7	1.0	......
31	......	......	......	......	......	......	19.8	19.4	......	16.5	1.0	......
Total	......	......	......	......	......	......	59.4	609.4	512.6	550.8	160.6	......
Mean	......	......	......	......	......	......	19.8	19.7	17.1	17.8	5.4	......
Acre-ft.	......	......	......	......	......	......	118	1210	1020	1090	321	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Rio Grande Drainage District, Diversion Into Prairie Ditch for 1918.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	8.7	15.0	14.7	21.6	12.2	8.9	16.0	4.8	......
2	......	......	......	9.0	15.2	15.0	21.6	11.4	9.3	16.1	4.8	......
3	......	......	......	9.1	15.4	15.3	21.7	10.5	9.7	16.2	4.8	......
4	......	......	......	9.4	15.5	15.6	21.7	10.0	10.1	16.3	4.7	......
5	......	......	......	9.6	15.6	15.9	21.8	9.6	10.5	16.4	4.7	......
6	......	......	......	10.0	15.6	16.2	21.8	9.3	11.0	16.5	4.7	......
7	......	......	......	10.2	15.3	16.5	21.9	9.0	11.5	16.6	4.6	......
8	......	......	......	10.4	15.0	16.8	21.9	8.7	12.0	16.7	4.6	......
9	......	......	......	10.6	14.7	17.1	22.0	8.4	12.5	16.8	4.6	......
10	......	......	......	11.0	14.4	17.4	22.1	8.1	12.8	16.9	4.5	......
11	......	......	......	11.0	13.6	17.7	22.2	7.8	13.0	17.0	4.5	......
12	......	......	......	11.2	12.8	18.0	22.2	7.5	13.2	17.0	4.5	......
13	......	......	......	11.4	12.0	18.4	22.0	7.2	13.4	16.9	4.5	......
14	......	......	......	11.6	11.2	18.8	21.6	6.9	13.6	16.9	4.4	......
15	......	......	......	11.8	10.4	19.1	21.1	6.6	13.8	16.9	4.4	......
16	......	......	......	12.0	9.6	19.4	20.5	6.4	14.0	16.8	4.4	......
17	......	......	......	12.2	8.8	19.8	20.0	6.2	14.2	16.8	4.4	......
18	......	......	......	12.4	8.0	20.1	19.5	6.0	14.4	16.8	4.3	......
19	......	......	......	12.6	7.2	20.3	19.0	5.8	14.6	16.7	4.3	......
20	......	......	......	12.8	6.4	20.6	18.5	5.7	14.8	16.7	4.3	......
21	......	......	......	13.0	5.7	20.7	18.0	5.6	15.0	5.3	4.2	......
22	......	......	......	13.2	5.1	20.8	17.5	5.8	15.1	5.3	4.2	......
23	......	......	6.4	13.4	4.6	20.9	17.0	6.1	15.2	5.2	4.2	......
24	......	......	6.6	13.6	12.3	21.0	16.5	6.4	15.3	5.2	4.1	......
25	......	......	6.7	13.8	12.6	21.0	16.0	6.7	15.4	5.1	4.1	......
26	......	......	7.1	14.0	12.9	21.1	15.5	7.0	15.5	5.1	4.1	......
27	......	......	7.4	14.2	13.2	21.2	15.0	7.3	15.6	5.0	4.0	......
28	......	......	7.7	14.4	13.5	21.3	14.5	7.6	15.7	5.0	4.0	......
29	......	......	8.0	14.6	13.8	21.4	14.0	7.9	15.8	4.9	4.0	......
30	......	......	8.2	14.8	14.1	21.5	13.5	8.2	15.9	4.9	4.0	......
31	......	......	8.5	......	14.4	......	13.0	8.5	......	4.9	......	......
Total	......	......	66.6	356.0	373.9	563.6	595.2	240.4	401.8	383.7	131.7	......
Mean	......	......	7.4	11.9	12.1	18.8	19.2	7.8	13.4	12.4	4.4	......
Acre-ft	......	......	132	708	744	1120	1180	480	797	762	262	......

Unless otherwise noted, all discharges are in cubic feet per second.

CHAPTER V

WATER RIGHT DECREES

The system of indexing the Water Right Decrees on file in this office was inaugurated by Mr. A. A. Weiland and is efficient and satisfactory in every way. The only weakness of this system is the incompleteness, due to the fact that the Clerks of the District Courts do not always file, in this office, the certified copies of decrees issued in their particular districts, although this is required by statute.

Efforts are still being made to secure copies of all these missing decrees and it is to be hoped that eventually the files will be complete.

While it is impossible to publish anything like a complete list of decrees on file, it is believed that even a few will be of assistance to at least that part of the state affected. With this in view the following list has been made for Water Districts Nos. 14, 17 and 67 in Irrigation Division No. 2.

STATE ENGINEER OF COLORADO

DITCH DECREES

DISTRICT NO. 17 DIVISION NO. 2 COUNTIES CROWLEY, EL PASO, LINCOLN, ELBERT, PUEBLO, LAS ANIMAS, OTERO, KIOWA AND BENT.

Page	Priority Number	NAME OF DITCH	APPROPRIATION Source	Date	Amount Decreed Sec. Ft.	LOCATION Sec.	Twp.	Range	P. M.	TRANSFERS Amount From Sec. Ft.	Amount To Sec. Ft.	REMARKS
163 175	1	Rocky Ford	Arkansas River	May 15/74	111.76	30	22S	57W	6th			
163 175	2	Jones	Arkansas River	Apr 10/75	44.5	9	23S	53W	6th			
164 175	3	Town Ditch of West Las Animas	Arkansas River	Mch 7/84	38.0	1	23S	53W	6th			
164 176	4	Arkansas River Land, Reservoir & Canal Co's Canal	Arkansas River	Apr 15/84	164.64	32	23S	56W	6th			
164 176	5	Catlin	Arkansas River	Dec 3/84	248.0	7	22S	59W	6th			
164 176	6	Arkansas River Land, Reservoir & Canal Co's Canal	Arkansas River	Mch 1/87	597.16	32	23S	55W	6th			
165 177	7	Catlin	Arkansas River	Nov 14/87	97.0	7	22S	59W	6th			
165 177	8	Riverside	Arkansas River	Mch 13/88	80.0	10	24S	53W	6th			
165 177	9	Horse Creek	Horse Creek	Dec 8/88	13.0	4	23S	53W	6th			
166 177	10	Lake Canal	Arkansas River	Sep 25/89	155.0	24	22S	58W	6th			
166 178	11	Potter Irrigating	Arkansas River	Feb 21/90	13.0	25	22S	57W	6th			
166 178	12	Crooked Arroya	Crooked Arroya	Feb 27/90	2.4	7	24S	55W	6th			
167 178	13	Otero Canal	Arkansas River	Mch 3/90	123.0	17	22S	59W	6th			
167 179	14	Rocky Ford	Arkansas River	May 6/90	96.54	30	22S	57W	6th			
167 179	15	A. J. Anderson	Crooked Arroya	Jan 3/91	6.81	5	24S	55W	6th			
167 179	16	Prinster	Anderson Arroya	May 1/91	3.75	16	25S	55W	6th			
168 179	17	Timpas Creek	Timpas Creek	May 18/91	51.84	8	24S	56W	6th			
168 180	18	Canady	Horse Creek	Jan 18/92	20.0	22	22S	54W	6th			
168 180	19	Lanckton	King Arroya	Mch 1/92	5.24	23	24S	55W	6th			
169 180	20	Prinster No. 2	Anderson Arroya	Mch 11/92	3.21	10	24S	55W	6th			
169 180	21	W. J. Baker	Arkansas River	May 13/92	15.0	10	23S	56W	6th			
169 181	22	Lanckton	King Arroya	Jun 1/93	9.76	23	24S	55W	6th			
169 181	23	A. J. Anderson	Crooked Arroya	Aug 29/93	8.19	5	24S	55W	6th			
170 181	24	Lake Canal	Arkansas River	Aug 30/93	445.0	24	22S	58W	6th			
170 182	25	Fort Lyon Canal	Arkansas River	Aug 31/93	171.0	32	23S	55W	6th			
205	28	Cheyenne	Adobe Creek	Dec 8/94	5.54	26	22S	53W	6th			
180		Fairview Extension of Crooked Arroya	Crooked Arroya	Jun 11/96	24.84	18	24S	55W	6th			
171 182	26	Herman Klinkerman	Horse Creek	Jan 22/97	4.5	4?	23S	53W	6th			
171 182	27	Osborne	Horse Creek	Jun 1/99	14.4	6	22S	54W	6th			
199	29	Box Springs Canal	Horse Creek	Oct 24/99	60.0							
208	30	Adobe Valley	Adobe Creek	Dec 1/99	13.6	34	21S	53W	6th			
193		Enlargement of Osborne	Horse Creek	Dec 1/99	12.5	6	22S	54W	6th			
199	31	Box Springs Canal	Horse Creek	Jul 5/01	300.0							
206	32	Cheyenne	Adobe Creek	Dec 19/01	2.46	26	22S	53W	6th			
196	33	Otero Canal	Arkansas River	Feb 2/03	165.0	17	22S	59W	6th			
196	33	Otero Canal	Arkansas River	Feb 2/03?	169.92	17	22S	59W	6th			
188		Haight	Patterson Hollow Arroya	Mch 26/07	4.91	8	23S	57W	6th			
212	35	Mustang Res.Canal and Land Company's Canal	Mustang Creek	Mch 17/02	5.0	8	24S	60W	6th			
214	34	Mustang Res.,Canal and Land Company's Canal Enl.& Extn.	Mustang Creek	Sep.27/04	100.0	8	24S	60W	6th			

STATE ENGINEER OF COLORADO

DITCH DECREES

DISTRICT NO. 17 DIVISION NO. 2 COUNTIES Otero & Kiowa Bent, Crowley, El Paso, Lincoln, Elbert, Pueblo, Las Animas.

Page	Priority Number	NAME OF DITCH	APPROPRIATION			LOCATION				TRANSFERS		REMARKS
			Source	Date	Amount Decreed Sec. Ft.	Sec	Twp.	Range	P.M.	Amount From Sec. Ft.	Amount To Sec. Ft.	
250	-----	Mallett No. 1	Bob Creek(So.Branch of)	Dec. 1/90	12.0	4	22S	57 W	6th			
240	----	Sand Arroya Triple Lakes	Sand Arroya	Apr.27/91	5.0	36	18S	55 W	6th			
257	----	Green	Horse Creek	Jan.25/92	22.0	19	21S	55 W	6th			
250	----	Mallett No. 1 Enlargement	Bob Creek(So.Branch)	Mar. 1/98	32.0	4	22S	57 W	6th			
231	----	Box Springs Canal & Res.Sys./Canal No.1.	Horse Creek	Oct.24/99	24.0	20	18S	56 W	6th			
231	-----	Box Springs Canal & Res.Sys./Canal No.1 Enl.	Horse Creek	July 5/01	299.5	20	18S	56 W	6th			
228	-----	The Swink Supply Canal	Apishapa River	July20.02	293.75	19	25S	59 W	6th			
242	-----	Beer	Adobe Creek	May.15/03	200.0	25	17S	54 W	6th			
240	----	Sand Arroya Triple Lakes Enl.	Sand Arroya	Jun.28/03	82.5	36	18S	55 W	6th			
269	28	Otero Canal	Arkansas River	July 3/03	169.92	17	22S	59 W	6th			
264	----	Lewis Supply Ditch No. 1	Bob Creek	July29/03	97.0	2	20S	58 W	6th			
264	---	Lewis Supply Ditch No. 2	Bob Creek	Jul/29/03	97.0	16	20S	58 W	6th			
236	---	Blain	Adobe Creek	Mar.30/04	80.0	5	20S	53 W	6th			
237	---	Best	North Prong Mustang Crk.	Apr. 1/04	72.0	22	18S	54 W	6th			
256	---	Horse Crk.& Black Draw D.&Res. Sys.Horse Crk.&Black Draw	Horse Creek	Aug.31/04	44.6	11	21S	56 W	6th			
246	-----	Hardesty	Mustang Creek	Feb.21/05	150.0	13	24S	61 W	6th			
248	-----	Eureka	Apishapa River	May 10/05	300.0	21	26S	60 W	6th			
248	----	Eureka	Saunders Arroya	May 10/05	100.0	21	26S	60 W	6th			
230	----	Prairie Land & Irr.Co's Supply Ditch No.1.	Dry Creek	Dec. 4/05	230.0	23	25S	58 W	6th			
225	----	Windmill Lake Supply Canal	West Pond Creek	Dec.30/05	77.5	32	10S	57 W	6th			
220	----	Timpas Creek Ditch No. 1	Timpas Creek	Jan.31/06	220.0							
221	----	Timpas Crk.Lateral D.No.1	Dry Creek(E.& Cernte Fks.	Jan.31/06	171.0							
221	----	Timpas Creek Lateral No. 3	Timpas & Dry Creeks	Jan/31/06	38.5							
244	----	Red Top	Mustang Creek	Jun. 5/06	125.0	33	24S	61 W	6th			
227	----	Dead Horse Creek	Dead Horse Creek	Jul. 2/06	11.5	2	19S	57 W	6th			
254	---	Great Northern Canal & Res.Sys. Great Northern Canal.	Horse Creek	Jan.30/07	25.0	9	18S	56 W	6th			
254	----	Crum Epler Irr.System,Well A.	Horse Creek Underflow	Jan.30/07	2.0	27	19S	56 W	6th			
221	---	Timpas Creek Lateral No.1	Dry Creek(E.& Center Fks.	Feb.12/07	50.0							
220	----	Timpas Crk.Ditch No.1,Enl.	Timpas Creek	Feb.12/07	230.0							
243	---	Lee	Sandy Arroya	May 28/07	75.0	13	25S	61 W	6th			
220	---	Timpas Crk.Ditch No.2,Enl	Timpas Creek	Aug.21/07	782.0							
249	----	Baldwin Stubbs	Arkansas River	Nov.30/07	33.02	18	22S	58 W	6th			
221	----	Timpas Creek Field Ditch No.1	Timpas & Dry Creeks	Jun. 8/08	24.0							
220	----	Timpas Crk.Supply Ditch No.2	Dry Creek(Center fork)	Jun. 8/08	205.0							
221	---	Timpas Crk.Lat.Ditch No.3,Enl.	Timpas & Dry Creeks	Jun. 8/08	29.5							
226	---	Cowden No. 2	West Pond Creek	Jul.18/08	12.0	32	18S	57 W	6th			
221	---	Timpas Crk.Lateral D. No.1,Enl	Dry Creek(E.&Center Fks.)	Oct. 5/08	62.0							
261	---	George Lewis D.No.1 Enl.	Bob Creek(Branch of)	Nov.12/08	75.0	2	20S	58 W	6th			
261	---	George Lewis D.No.2 Enl.	Bob Creek(Branch of)	Nov.12/08	75.0	16	20S	58 W	6th			
260	---	George Lewis Supply Ditch No.3	Bob Creek(W.Branch)	Nov.12/08	25.0	20	20S	58 W	6th			

STATE ENGINEER OF COLORADO

DITCH DECREES

DISTRICT NO. 17 DIVISION NO. 2 COUNTIES Pueblo, Las Animas, Otero & Kiowa. Bent, Crowley, El Paso, Lincoln, Elbert.

Page	Priority Number	NAME OF DITCH	APPROPRIATION			LOCATION				TRANSFERS		REMARKS
			Source	Date	Amount Decreed Sec. Ft.	Sec.	Twp.	Range	P. M.	Amount From Sec. Ft.	Amount To Sec. Ft.	
257	-----	Highland Canal	Purgatoire River	Mar. 1/09	28.375	1	25S	53 W	6th			
[illegible]	----	Cline	Mustang Creek	Jun.20/09	5.0	16	18S	54 W	6th			
228	----	Cowden No. 1	West Pond Creek	Jul.18/09	15.0	32	18S	57 W	6th			
251	----	Box Springs Canal & Res.Sys. Canal No.1,2nd Enl.	Horse Creek	Sep.11/09	126.0	20	18S	56 W	6th			
252	----	Crum Epler Irr.Sys.Cow Buttes Ditch.	Cow Buttes Arroyo	Sep.12/09	40.0	1	19S	56 W	6th			
261	----	George Lewis Supply Canal No.	Middle Br.Bob Creek & W. branch	Feb.23/10	25.0	22 & 28	18S	58 W	6th			
262	---	George Lewis Supply D. No.6	Branch of Bob Creek	Dec. 1/10	50.0	24 19	20S	59 W 56 W	6th 6th			

STATE ENGINEER OF COLORADO

TRANSFER

DITCH DECREES

DISTRICT NO. 17 DIVISION NO. 2 COUNTIES CROWLEY, EL PASO, LINCOLN, ELBERT, PUEBLO, LAS ANIMAS, OTERO, KIOWA AND BENT

Page	Priority Number	NAME OF DITCH	APPROPRIATION Source	Date	Amount Decreed Sec. Ft.	LOCATION Sec.	Twp.	Range	P.M.	TRANSFERS Amount From Sec. Ft.	Amount To Sec. Ft.	REMARKS
62	2	Jones	Arkansas River	Apr 10/75	44.3	7	22S	59W	6th	22.0		
62	2	Catlin	Arkansas River	Apr 10/75	44.3	9	23S	53W	6th		22.0	
62	5	Catlin	Arkansas River	Dec 3/84	248.0	9	23S	53W	6th	22.0		
62	5	Jones	Arkansas River	Dec 3/84	248.0	7	22S	59W	6th		22.0	
No. 241	3	Town Ditch of West Las Animas Co.	Arkansas River	Mar.7/89	38.0	9	23S	53W	6th	5.5		
No. 241	3	Las Animas Consolidated Canal	Arkansas River	Mar.7/89	38.0	1	23S	53W	6th		5.5	

STATE ENGINEER OF COLORADO

RESERVOIR DECREES

DISTRICT NO. 17 DIVISION NO. 2 COUNTIES CROWLEY, EL PASO, LINCOLN, ELBERT, PUEBLO, LAS ANIMAS, OTERO, KIOWA AND BENT.

Page	Priority Number	Name of Reservoir	Source of Supply	Decree			Location				Remarks
				Date	Depth Feet	Amount Cubic Feet	Sec.	Twp.	Range	P.M.	
171 183	1	Prince	Arkansas River	Aug 12/89		66,000,000					
172 183	2	No. 1 Reservoir of Lake Canal	Arkansas River	Mch 2/92		185,001,980					
199	3	Box Springs No. 1	Horse Creek	Oct 24/99		6,500,000					
199	4	Box Springs No. 2	Horse Creek	Oct 24/99		28,000,000					
199	5	Box Springs No. 3	Horse Creek	Oct 24/99		9,000,000					
199	6	Box Springs No. 1	Horse Creek	Jul 5/01		25,000,000					
199	7	Box Springs No. 2 (Reservoir No.)	Horse Creek	Jul 5/01		38,500,000					
199	8	Box Springs No. 3	Horse Creek	Jul 5/01		22,000,000					
199	9	Box Springs No. 4 (Reservoir No.)	Horse Creek	Jul 5/01		12,000,000					
199	10	Box Springs No. 5 (Reservoir No.)	Horse Creek	Jul 5/01		21,000,000					
215	--	Brown	Mustang Creek	Sep.27/04		1,065.7	8	24S	60W	6th	
250	--	Mallett No. 1	Bob Creek(So.branch)	Dec. 1/90		27.41 ac.ft.	9	22S	57W	6th	
251	--	Mallett No. 2	Bob Creek(So.branch)	Dec. 1/90		18.84 ac.ft.	15	22S	57W	6th	
235	--	Great Plains System	Arkansas River	Aug. 1/96		265,552 ac.ft.	-	--	--	-	
265	---	Horse Creek	Horse Crk.& Arkansas R.	Jun.-1900		28,000 ac.ft.					
228	--	Swink	Apishapa River	Jul.20/02		275,891,616					
244	--	Red Top	Mustang Creek	Jun. 5/03		931 ac.ft.					
240	--	Sand Arroya Nos. 1,2 & 3	--------	Jun.28/03		933 ac.ft.					
263	--	Lewis	Bob Creek	Jul.29/03		62,343,500					
237	--	Best	Mustang Crk.(No.prong)	Apr. 1/04		33,904,125					
256	--	Horse Crk.& Black DrawD.&Res. System.Horse Drk.&Black Dr.	Horse Creek	Aug.31/04		4,890,196					
246	--	Hardesty	Mustang Creek	Feb.21/05		1,565 ac.ft.					
230	—	Prairie Land & Irr.Co's No.1	Dry Creek	Dec. 4/05		223,582,204					
226	—	Windmill Lake	West Pond Creek	Dec.30/05		9,544,056					
222	--	Timpas Creek No. 2	Timpas & Dry Creeks	Jan.31/06		128,585,188					
229	--	Swink No. 2	Apishapa River	May 38/06		41,110,800					
263	--	Lewis , Enlargement	Bob Creek	Jun.30/06		8,093,400					
254	--	Great Northern Canal & Res. System.Great Northern	Horse Creek	Jun.30/07		7,780,256					
222	--	Timpas Creek No. 3	Timpas & Dry Creeks	Feb.12/07		79,725,000					
243	--	Lee	Sandy Arroya	Nov.28/07		60.4 acre ft.					
252	--	Crum Epler Irr.System No.2	Cow Buttes Arroya	Feb. 4/08		3,597,750					
229	--	Swink No. 3	Apishapa River	Jun. 5/08		89,191,450					
259	--	George Lewis No. 3	Bob & Breckenridge Crks.	Nov.12/08		13,894,740					
231	--	Box Springs Canal & Res.Sys./ No.1 Res.	Horse Creek	Sep.11/09		1,509,527					
232	--	Box Springs Canal & Res.Sys./ No.2 Res.	Horse Creek	Sep.11/09		18,368,256					
232	--	Box Springs Canal & Res.Sys./ No.3.Res.	Horse Creek	Sep.11/09		2,595,718					
233	—	Box Springs Canal & Res.Sys./ No.4 Res.	Horse Creek	Sep.11/09		12,161,110					
233	--	Box Springs Canal & Res.Sys./ No.5 Res.	Horse Creek	Sep.11/09		2,493,185					
252	--	Crum Epler Irr.Sys.No.2 Enl.	Cow Buttes Arroya	Nov.10/10		1,402,250					

STATE ENGINEER OF COLORADO

RESERVOIR DECREES

DISTRICT NO. 17 DIVISION NO. 2 COUNTIES, OTERO, KIOWA, BENT, ELBERT, PUEBLO, LAS ANIMAS, CROWLEY, EL PASO AND LINCOLN.

Page	Priority Number	NAME OF RESERVOIR	SOURCE OF SUPPLY	DECREES			LOCATION				REMARKS	
				Date	Depth Feet	Amount Cubic Feet	Sec.	Twp.	Range	P.M.		
270	10	Lake Henry	Arkansas River	-- 1891		276,734,714	--	20-21	56 W	6th		
272	11	Lake Meredith	Arkansas River	Mar. 9/98		225,261,714	--	21-22	57 W	6th		
272	11	Lake Meredith	Arkansas River	Mar. 9/98		907,955,390	--	21-22	57 W	6th		

STATE ENGINEER OF COLORADO

DITCH DECREES

DISTRICT NO. 67 DIVISION NO. 2 COUNTIES LAS ANIMAS.& KIT CARSON. CHEYENNE,BENT,PROWERS,BACA ELBERT,LINCOLN,KIOWA,EL PASO,

Page	Priority Number	NAME OF DITCH	APPROPRIATION			LOCATION				TRANSFERS		REMARKS
			Source	Date	Amount Decreed Sec. Ft.	Sec.	Twp.	Range	P.M.	Amount From Sec. Ft.	Amount To Sec. Ft.	
8-29	1	Keesee	Arkansas River	Mar/13/71	9.0	6	23S	46W				
2-29	2	Abe Peterson	Arkansas River.	May/31/73	6.3	3	23S	49W				
11-30	3	Lamar Canal	Arkansas River	Nov/30/75	15.75	29	22S	46W				See Card
47-51	3	Lamar Canal-See Card	Arkansas River	Nov/30/75	15.75	22 29	22S	46W				See Card
8-30	4	Keesee	Arkansas River	Dec/31/83	4.50	6	23S	46W				
16	5	Buffalo Creek	Arkansas River	Jan/29/85	67.5	31	22S	43W				
17-31	6	Colorado & Kansas	Arkansas River	Apr/1/86	27.77	6	23S	46W				
47-51	6½	Lamar Canal, See Card	Arkansas River	Nov/4/86	72.09	22 29	22S	46W				See Card
19-31	7	Amity Canal	Arkansas River	Feb/21/87	283.5	36	22S	48W				
47-51	7½	Lamar Canal, See Card	Arkansas River	Apr/16/87	13.64	22 29	22S	46W				See Card
20-31	8	Hyde	Arkansas River	May/10/87	25.44	28 29	22S	46W				
21-32	10	Bed Rock	Arkansas River	Mar/10/89	32.77	36	22S	48W				
25-33	11	N.Y. Irrigating Ditch Co's. Canal	Arkansas River	Jul/22/89	69.0	36	22S	45W				
47-52	12	Lamar Canal, See Card	Arkansas River	Sep/11/89	11.7	33	22S	47W				See Card
44-57	12½	Sisson Irrigating No. 2	Arkansas River	Dec/20/89	6.85	19	23S	41W				
11-30		Gould & Barkley										See Card
47-52	13	Lamar Canal	Arkansas River	Jul/16/90	184.27	25 33 29	22S	47W				See Card
21-34	14	Bed Rock	Arkansas River	Aug/22/90	26.27	36	22S	48W				
24-35	15	Manvil	Arkansas River	Oct/14/90	54.0	32	22S	45W				
26-35	16	M.R.McCauley Irrigating	John Donlon Draw, trib. to Arkansas River	Aug/15/91	110.14	28	22S	51W				
27-35	17	Graham	Arkansas River	Aug/24/91	61.0	25	22S	45W				
28-35	18	J.A.Pierce	John Donlon Draw	Sep/6/91	2.25	28	22S	51W				
106	19	Sisson-Stubbs	Arkansas River	Dec/1/91	18.0	14	23S	43W				See Card
103	1	George Simpson No. 1	Limestone Creek.	Dec/5/91	1.8	1	22S	49W				
103	2	Dingwall	Limestone Creek	Dec/31/91	1.8	1	22S	49W				
103	3	Limestone No. 1	Limestone Creek.	Mar/1/94	1.35	11	22S	49W				
99	1	Pleasant Valley Ditch & Reservoir System	Pleasant Valley Seepage Stream.	Apr/1/95	3.6	25	21S	48W				
106	20	Sisson-Stubbs	Arkansas River.	Dec/1/95	7.2	14	23S	43W				
99	2	Taylor No. 1	Pleasant Valley Seepage Stream.	Jan/15/96	0.63	30	21S	47W				
109	1	Sapp	Wild Horse Creek	Jan/27/96	9.0	21	22S	42W				
100	3	McKibbon Short Line	Pleasant Valley Seepage Stream.	Feb/24/96	1.08	21	22S	47W				
100	4	Parmenter Seepage	Pleasant Valley Seepage Stream.	Apr/1/96	1.26	8	22S	47W				
100	5	Noon Seepage	Pleasant Valley Seepage Stream.	May/1/96	10.0	17 20	22S	47W				See Card
103	4	Limestone No. 3	Limestone Creek.	May/10/96	0.54	2 11	22S	49W				
101	6	Eaton	Pleasant Valley Seepage Stream.	Apr/1/98	1.08	17	22S	47W				
104	5	George Simpson No. 2	Limestone Creek.	May/15/99	0.27	36	21S	49W				
102	7	Schermerhorn.	Pleasant Valley Seepage Stream.	Apr/1/00	1.08	24	21S	48W				
102	8	Rowe Seepage Lateral No. 1	Pleasant Valley Seepage Stream	Apr/10/00	0.63	7	22S	47W				
102	9	Taylor No. 4	Pleas.Valley Seepage St	Apr/1/01	1.17	25	21S	47W				
~~11~~	~~33~~	~~Mustang Reservoir, Canal and Land Company's Canal~~	~~Mustang Creek~~	~~Mar/17/0~~	~~5.0~~	~~6~~	~~24S~~	~~50W~~	Should be in Dist.No. 17.			

STATE ENGINEER OF COLORADO

DITCH DECREES

DISTRICT NO. 67 DIVISION NO. 2 COUNTIES ELBERT, KIOWA, LINCOLN, EL PASO, CHEYENNE, BENT, PROWERS, BACA & LAS ANIMAS. & KIT CARSON.

Page	Priority Number	NAME OF DITCH	APPROPRIATION Source	Date	Amount Decreed Sec. Ft.	LOCATION Sec.	Twp.	Range	P.M.	TRANSFERS Amount From Sec. Ft.	Amount To Sec. Ft.	REMARKS
102	10	Arthur Carver No. 1	Pleasant Valley Seepage Stream	Jul/1/03	0.036	14	21S	48W				
102	11	Taylor No. 2	Pleasant Valley Seepage Stream	Mar/15/04	0.18	25	21S	48W				
~~114~~	~~54~~	~~Mustang Reservoir, canal & Land Co's. Canal Enlg. & Ext.~~	~~Mustang Creek~~	~~Sep/27/04~~	~~100.0~~	~~9~~	~~24S~~	~~60W~~				~~Belongs in District No. 17.~~
106	1	Primrose	Rush Creek	May/5/05	12.0	5	17S	47W				
107	1	Graveyard	Graveyard Creek	Jan/27/06	3.5	34	22S	46W				
110	2	Pauls Creek	West Br. Wild Horse Crk.	Feb/10/06	8.0	28	22S	42W				
285	1918-1	Ideal	Markham Arroyo etc.	Mar/28/92	10.0	20	22S	46W	6th			
287	1918-2	Colorado - Kansas	Arkansas River	Jan. 1/93	50.0	6	23S	48W	6th			
290	1918-3	Amity	Arkansas River	Apr. 1/93	500.0	36	22S	48W	6th			
293	1918-3A	Amity	Big Sandy Creek	Apr. 1/93	510.0	21	21S	45W	6th			
296	1918-3B	Amity	Big Bend Draw	Apr. 1/93	700.0	36	22S	46W	6th			
300	1918-3C	Amity	Goulds or Harper School Draw.	Apr. 1/93	700.0	23	22S	48W	6th			
303	1918-4	Keesee	Arkansas River	Sept.3/93	15.0	6	23S	49W	6th			
305	1918-5	Huey No. 1	Gageby Creek	Aug. 1/95	8.0	25	22S	51W	6th			
311	1918-6A	Buffalo Creek	Buffalo Creek	Oct. 1/95	135.0	31	22S	45W	6th			
308	1918-6	Buffalo Creek	Deadman Draw	Oct. 1/95	135.0	33	22S	45W	6th			
314	1918-B	Buffalo Creek	Puntney Draw	Oct. 1/95	135.0	36	22S	44W	6th			
318	1918-6C	Buffalo Creek	House Draw Stream	Oct. 1/95	107.0	6	23S	42W	6th			
321	1918-6D	Buffalo Creek	Simpson Draw Stream	Oct. 1/95	105.0	11	23S	42W	6th			
324	1918-7	Godley	Paradox Valley	Jan.22/96	1.0	24	22S	46W	6th			
326	1918-8	J. K. Martin	Seepage from lands	Apr. 1/00	0.6	23	22S	46W	6th			
287	1918-9	Colorado - Kansas	Arkansas River	Dec.31/05	20.0	6	23S	48W	6th			
328	1918-10	Huey	McRae Arroya	May 2/02	3.25	29	22S	50W	6th			
330	1918/11	Wood	Spring Fk.E.Wild Horse Creek.	Dec.19/04	6.0	23	22S	42W	6th			
332	1918-12	Sweitzer	Rush Creek	May 1/05	50.0	26	17S	47W	6th			
334	1918-13	Mead Seepage	Paradox Valley	Nov.13/05	1.5	19	22S	45W	6th			
1.0	1918-14	Harker Seepage	Paradox Valley	Nov.20/05	1.0	30	22S	45W	6th			
338	1918-15	L and L Seepage	Seepage & Seepage etc.	Nov.22/06	1.0	5	22S	46W	6th			
340	1918-16	Silver Dale Irr.System	Seepage from land	Jan. 8/07	0.72	19	21S	47W	6th			
342	1918-17	Primrose Ditch & Reservoir	Rush Creek	Nov.13/07	10.0	5	17S	47W	6th			
345	1918-18	Sayler & Nowolds	May Valley	May 26/08	6.0	8	22S	46W	6th			
347	1918-19	Thomas	Rule Creek	Jun. 1/08	11.0	25	27S	51W	6th			
349	1918-20	Pierce	Mud Creek	Sep. 2/08	8.0	11	24S	49W	6th			
351	1918-21	Amity	May Valley Seepage Stream	Oct. 5/08	500.0	17	22S	46W	6th			
357	1918-22A	Cline	Durkee Crk.Res.&Durkee Crk.	Oct.7/06	8.0	8	25S	45W	6th			
355	1918-22	Brown	Plum Creek	Oct. 7/06	8.0	10	25S	45W	6th			
359	1918-23	Main line Pipe Line & Seepage.	Pleasant Valley Seepage Stream.	Jul. 1/09	1.0	11	21S	48W	6th			
362	1918-24	Poor Mans	Rule Creek	Dec.16/09	27.0	14	24S	51W	6th			
305	1918-25	Huey No. 1	Gageby Creek	Feb.26/10	2.0	25	22S	51W	6th			
366	1918-26	Murray	Dripping Spring Draw	May 1/11	5.0	28	29S	50W	6th			
364	1918-27	Smith Seepage	Seepage, percolating etc	Sep.11/11	3.0	19	22S	45W	6th			

STATE ENGINEER OF COLORADO

DITCH DECREES DISTRICT NO. 67 DIVISION NO. 2 COUNTIES Bent, Prowers, Baca, Las Animas & Kit Carson Elbert, Kiowa, Lincoln, El Paso, Cheyenne,

Page	Priority Number	NAME OF DITCH	APPROPRIATION			LOCATION				TRANSFERS		REMARKS
			Source	Date	Amount Decreed Sec. Ft.	Sec.	Twp.	Range	P. M.	Amount From Sec. Ft.	Amount To Sec. Ft.	
369	1918-29	Cameron	Cottonwood Creek	Dec.15/11	3.0	5	28S	50 W	6th			
371	1918-30	L. B. No. 1	Rule Creek	Jun.1/14	13.0	17	25S	50 W	6th			
373	1918-31	Pierce Ditch Enlargement	Mud Creek	Dec.21/14	18.0	11	24S	49 W	6th			
375	1918-32	Creaghe No. 1	Creaghe Res. & Seepage	Feb. 3/15	0.6	22	22S	46 W	6th			
377	1918-32A	Creaghe No. 2	Creaghe Reservoir	Feb. 3/15	0.6	22	22S	46 W	6th			
380	1918-33	Garrard & Mechling	Butte Creek	Apr. 5/15	4.0	28	27S	45 W	6th			

STATE ENGINEER OF COLORADO

T-R-A-N-S-F-E-R-S

DITCH DECREES DISTRICT NO. 67 DIVISION NO. 2 COUNTIES BACA, LAS ANIMAS, CHEYENNE, KIOWA, BENT, PROWERS, ELBERT, EL PASO, LINCOLN, KIT CARSON,

	Page	Priority Number	NAME OF DITCH	APPROPRIATION			LOCATION				TRANSFERS		REMARKS
				Source	Date	Amount Decreed Sec. Ft.	Sec.	Twp.	Range	P.M.	Amount From Sec. Ft.	Amount To Sec. Ft.	
&	No. 112	10	Bed Rock	Arkansas River	Mch.10/89	32.77	6	23S	48 W	6th	32.77		
&	No. 112	10	Colo. & Kansas	Arkansas River	Mch.10/89	32.77	6	23S	48 W	6th		32.77	
&	No. 112	14	Bed Rock	Arkansas River	Aug.12/90	26.77	6	23S	48 W	6th	26.77		
&	No. 112	14	Colo. & Kansas Canal	Arkansas River	Aug.12/90	26.77	6	23S	48 W	6th		26.77	

STATE ENGINEER OF COLORADO

RESERVOIR DECREES

DISTRICT NO. 67 DIVISION NO. 2 COUNTIES LAS ANIMAS, KIT CARSON, CHEYENNE, BENT, PROWERS, BACA, ELBERT, KIOWA, LINCOLN, EL PASO

Page	Priority Number	NAME OF RESERVOIR	SOURCE OF SUPPLY	DECREE			LOCATION				REMARKS
				Date	Depth Feet	Amount Cubic Feet	Sec.	Twp.	Range	P.M.	
38 39	1	Butte	Arkansas River	Mar/30/92		30 sec.ft.	25	22S	47 W		
~~118~~	~~——~~	~~Brown (See District No.17)~~	~~Mustang Creek~~	~~Sep/27/94~~		~~1,665.7 ac.ft.~~	~~8~~	~~24S~~	~~50 W~~		
107	1	Primrose	Rush Creek	May/ 5/05		24 sec.ft.	3	17S	47 W		
584	1918-1	Sweitzer No. 1	Rush Creek	May 1/05		692.12 ac.ft.	25	17S	47 W	6th	
585	1918-2	Sweitzer No. 2	Rush Creek	May 1/05		509.22 ac.ft.	25	17S	47 W	6th	
587	1918-3	Sayler & Howells	May Valley	May 26/08		2,622,512	8	22S	46 W	6th	
588	1918-4	Durkee Creek	Durkee Creek	Oct. 7/08		6,773,580	8	25S	45 W	6th	
590	1918-5	Huey	McBáe Arroyo	May 24/10		87 acre ft.	29	22S	50 W	6th	
592	1918-6	Creaghe	Seepage from lands	Feb. 3/15		81.8 acre ft.	22	22S	46 W	6th	

STATE ENGINEER OF COLORADO

DITCH DECREES DISTRICT NO. 14 DIVISION NO. 2 COUNTIES TELLER, PUEBLO, FREMONT, EL PASO & CUSTER.

Page	Priority Number	NAME OF DITCH	APPROPRIATION			LOCATION				TRANSFERS		REMARKS
			Source	Date	Amount Decreed Sec. Ft.	Sec.	Twp.	Range	P. M.	Amount From Sec. Ft.	Amount To Sec. Ft.	
88	1	Toof	Fontaine qui Bouille	Feb/20/60	4.0	1	18S	65 W	6th			
89.	2	Warrant, Barnes & Baxter (See Orchard Grove Ditch Page 180)	Arkansas River	Apr/ 1861	9.0	35	20S	64 W	6th			See Card
91	3	Arkansas Valley Irrigating	Arkansas River	Jul/22/61	2.0	1	21S	62 W	6th			
92	4	Excelsior	Arkansas River	Dec/ 1861	60.0	32	20S	63 W	6th			
93	5	Eder	Fontaine qui Bouille	Jan/1/ 62	5.0	6	18S	64 W	6th			
95	6	Whipple	Fontaine qui Bouille	Mar/15/62	1.1	19	18S	64 W	6th			
96	7	Greenview	Fontaine qui Bouille	Spring 62	2.0	19	19S	64 W	6th			
98	8	M. W. Steele	Fontaine qui Bouille	Mch/1/63	1.0	7	19S	64 W	6th			
146	8½	Lincoln	Fontaine qui Bouille	Mch/1863	0.5	30	18S	64 W	6th			
91	9	Arkansas Valley Irrigating	Arkansas River	Year/1863	48.0	1	21S	62 W	6th			
99	10	C. L. Barnard	Fontaine qui Bouille	Feb/1864	0.6	31	18S	64 W	6th			
101	11	Booth	Arkansas River	Apr/1/64	8.0	5	21S	64 W	6th			
91	12	Arkansas Valley Irrigating	Arkansas River	1864	20.0	1	21S	62 W	6th			
102	13	H. R. Steele	Fontaine qui Bouille	Feb/1/65	2.0	6	19S	64 W	6th			
103	14	Cozzens	Fontaine qui Bouille	Feb/10/66	0.4	13	20S	65 W	6th			
105	15	Wood Valley	Fontaine and a Spring	Mar/1/66	8.0	7	18S	64 W	6th			
107	16	J. W. Cawlfield	Fontaine qui Bouille	Mar/15/66	0.4	31	18S	64 W	6th			
169	16½	Rogers	Arkansas River	June/1866	3.0	33	20S	66 W	6th			See Card
108	17	Bannister	Fountaine qui Bouille	Latter part/66	1.6	18	18S	64 W	6th			
109	18	Arkansas	Arkansas River	Jan/8/67	2.5	36	20S	64 W	6th			
110	19	Benesch	Fountaine qui Bouille	Feb/12/67	1.2	19	18S	64 W	6th			
111	20	Enterprise (See Oxford Farmers Ditch)	Arkansas River	Fall /67	14.0	31	21S	60 W	6th			See Card
113	21	Sutherland	Fontaine qui Bouille	Feb/15/68	1.8	19	18S	64 W	6th			
114	22	Olin	Fontaine qui Bouille	Dec/16/68	1.3	18	19S	64 W	6th			
116	23	Cactus	Fontaine qui Bouille	Jan/9/69	1.0	25	19S	64 W	6th			
117	24	McNeil (See C. L. Barnard Ditch)	Fontaine qui Bouille	Feb/ 1869	1.6	6	19S	64 W	6th			See Card
119	25	Ballow Hill	Arkansas River	Jul/1/69	16.0	6	21S	62 W	6th			
120	26	Richie	Arkansas River	Spring/70	2.5	15	20S	67 W	6th			
121	27	Hamp-Bell	Arkansas River	Nov/1870	2.5	36	20S	66 W	6th			See Card
122	28	Barnum, Also called Lewis Barnum Ditch	Arkansas River	1870	3.4	4	21S	64 W	6th			
123	29	Brooks	Arkansas River	Jan/1871	1.2	25	20S	67 W	6th			
124	30	Hobson	Arkansas River	Mar/1871	1.6	1	20S	68 W	6th			
101	31	Booth	Arkansas River	1871	1.0	5	21S	64 W	6th			
125	32	West Pueblo (Formerly Mahoney Ditch)	Arkansas River	Apr/1/72	1.2	31	20S	65 W	6th			See Card
127	33	Fields	Arkansas River	Spring/72	4.6	15	20S	67 W	6th			
171	33½	Cape Horn Ranch	Arkansas River	Sep/18/73	2.0	29	20S	66 W	6th			
128	34	Morey (See West Pueblo Ditch)	Arkansas River	Apr/1/74	1.0	27	20S	65 W	6th			See Card
171	34½	Cape Horn Ranch	Arkansas River	1876	3.0	29	20S	66 W	6th			
155	57	West Pueblo (Enlargement & Extension)	Arkansas River	Dec/17/77	15.0	31	20S	65 W	6th			See Card
130	35	Haden(See W. Pueblo Ditch)	Arkansas River	Oct/1/78	0.6	27	20S	65 W	6th			See Card

STATE ENGINEER OF COLORADO

DITCH DECREES

DISTRICT NO. 14 DIVISION NO. 2 COUNTIES TELLER, PUEBLO, EL PASO, FREMONT & CUSTER.

Page	Priority Number	NAME OF DITCH	APPROPRIATION			LOCATION				TRANSFERS		REMARKS
			Source	Date	Amount Decreed Sec. Ft.	Sec.	Twp.	Range	P. M.	Amount From Sec. Ft.	Amount To Sec. Ft.	
121	36	Hamp-Bell	Arkansas River	1878	0.7	36	20S	66 W	6th			See Card
105	37	Cozzens	Fontaine qui Bouille	1879	1.6	13	20S	65 W	6th			See Card
116	38	Caster	Fontaine qui Bouille	1879	0.5	25	19S	64½W	6th			
132	39	T. J. Steele	Fontaine qui Bouille	Feb/1/80	0.4	24	19S	65 W	6th			
134	40	Collier (See Cawlfield No.2 Ditch, Page 164)	Arkansas River	May/4/81	14.0		21S	62 W	6th			See Card
135	41	I. N. Sater	Arkansas River	Jun/20/81	2.0	36	20S	64 W	6th			
101	42	Booth	Arkansas River	1881	2.0	5	21S	64 W	6th			
164	42½	Cawlfield No. 2	Arkansas River	Mar/1882	8.0		21S	62 W	6th			See Card
136	43	Greenview (Enlg.)	Fontaine qui Bouille	Apr/1882	0.6	19	19S	64 W	6th			
137	44	Riverside Dairy	Arkansas River	Feb/1/83	1.0	34	20S	65 W	6th			
130	45	Haden (See W. Pueblo Ditch)	Arkansas River	1883	0.4	27	20S	65 W	6th			See Card
138	46	Pueblo Water Company's	Arkansas River	Apr/22/84	22.66	34	20S	65 W	6th			See Card
140	47	Chilcott	Fontaine qui Bouille	Mar/10/85	0.6	7	20S	64 W	6th			
142	48	Hallow Hill (Enlg.)	Arkansas River	Jun/1885	30.0	6	21S	62 W	6th			
107	49	J. W. Cawlfield	Fontaine qui Bouille	1885	0.6	31	18S	64 W	6th			
143	50	Allen (See Rocky Ford Highline)	Arkansas River	Mar/11/86	2.0	16	21S	61 W	6th			
145	51	Hobson (Enlargement)	Arkansas River	Apr/1/86	4.4	1	20S	68 W	6th			
146	52	Lincoln	Fontaine qui Bouille	Jun/1/87	1.5	30	18S	64 W	6th			
147	53	Oxford Farmers (Enlg.& Ext of Enterprise)	Arkansas River	Feb/26/87	116.0	31	21S	60 W	6th			See Card
164	53½	Cawlfield No. 2	Arkansas River	Mch/10/87	4.0		21S	62 W	6th			
149	54	McElroy	Fontaine qui Bouille	Apr/4/87	0.8	12	19S	65 W	6th			
151	55	Bessemer	Arkansas River	May/1/87	364.0	33	20S	66 W	6th			See Card
153	56	Hobson No. 2	Fontaine qui Bouille	Jun/10/87	6.0	24	19S	65 W	6th			See Card
156½	58	Booth (Mueller and Goldsmith Enlg.)	Arkansas River	Mar/30/88	2.1	34	20S	64 W	6th			
121	59	Hamp-Bell	Arkansas River	1888	1.6	36	20S	66 W	6th			
167	59½	Trustee of Pueblo Water Works	Arkansas River	Feb/20/89	46.0	33	20S	65 W	6th			
157	60	Rocky Ford Highline	Arkansas River	Jan/6/90	418.0	17	21S	61 W	6th			See Card
143	61	Allen	Arkansas River	1890	2.5	16	21S	61 W	6th			
159	62	Colorado	Arkansas River	Jun/9/90	756.2	10	21S	62 W	6th			
93	63	Eder.	Fontaine qui Bouille	1892	5.0	6	18S	64 W	6th			
109	64	Arkansas	Arkansas River	1892	1.5	36	20S	64 W	6th			
160	65	Booth (Christian Fink, Enl.& Ext.)	Arkansas River	Middle Apr/1893	3.2	34	20S	64 W	6th			
136	66	Greenview (Enlargement)	Fontaine qui Bouille	1893	0.2	19	19S	64 W	6th			
89	67	Warrant, Barnes & Baxter (See Orchard Grove Ditch Page 180)	Arkansas River	1894	7.0	35	20S	64 W	6th			
197		Barnum Seepage	Seepage from Bessemer Ditch & Laterals	1893	6.5	4	21S	64 W	6th			
195	67A	Rule	Turkey Creek	1893	2.5	17	18S?	66 W?	6th			
196	67B	Young & Calaway	Fountain Creek	1893	5.5	1	18S	65 W	6th			
198	67C	May	Turkey Creek	Mch/1896	2.0	7	18S	66 W	6th			
199	67D	Bean	Turkey Creek	Jul/23/96	0.5	1	19S	67 W	6th			
200	67E	Palmer	Turkey Creek	Aug/3/96	0.5	1	19S	67 W	6th			

STATE ENGINEER OF COLORADO

DITCH DECREES

DISTRICT NO. 14 DIVISION NO. 2 COUNTIES TELLER, PUEBLO, FREMONT, EL PASO, & CUSTER.

Page	Priority Number	NAME OF DITCH	APPROPRIATION			LOCATION				TRANSFERS		REMARKS
			Source	Date	Amount Decreed Sec. Ft.	Sec.	Twp.	Range	P. M.	Amount From Sec. Ft.	Amount To Sec. Ft.	
201		Pueblo Water Supply & Power Co.	Underflow & Subterranean waters of Fountain River	May/10/02		30	18S	64 W	6th			
204	69	Red Creek	Red Creek	Sep/1902	40.0	22	21S	68 W	6th			
206	70	Dotson Supply	Chicosa Creek	Oct/1/03	60.0	32	22S	61 W	6th			
200	71	Palmer	Turkey Creek	1908	0.5	1	19S	67 W	6th			
209	72	Teller Canal	Turkey Creek	Aug/13/09	2.0	1	19S	67 W	6th			
196	75	Young & Calaway	Fountain Creek	1910	1.0	1	18S	65 W	6th			
198	76	May	Turkey Creek	1910	0.5	7	18S	66 W	6th			
212	73	Prather Drain and Seepage Ditch B	Turkey Creek	Mch/10/10	0.8	25	19S	67 W	6th			
213	74	Toof and Harman	Fountain Creek	Nov/14/10	5.0	1	18S	65 W	6th			
214	77	Davis	Turkey Creek	Aug/1/11	0.7	31	18S	66 W	6th			
215	78	Hermie	Turkey Creek	Oct/14/12	1.0	1	19S	67 W	6th			
216	79	Nyberg	Chico Creek	Jan/1/13	5.0	18	20S	62 W	6th			
226 233	1	H.O.P No. 2	Spring Branch	Jul.1/75	2.0	29	17S	63 W	6th			
226 233	2	H.O.P. No. 1	Spring Branch	Jun.1/81	2.0	29	17S	63 W	6th			
226 233	3	Smith No. 1	Spring Branch	Mch.1/95	1.0	5	18S	63 W	6th			
233	4	Smith No. 2	Spring Branch	Apr.15/02	1.0	5	18S	63 W	6th			

TRANSFER

STATE ENGINEER OF COLORADO

DITCH DECREES DISTRICT NO. 14 DIVISION NO. 2 COUNTIES CUSTER, TELLER, PUEBLO, FREMONT, EL PASO

Page	Priority Number	NAME OF DITCH	APPROPRIATION			LOCATION				TRANSFERS		REMARKS
			Source	Date	Amount Decreed Sec. Ft.	Sec.	Twp.	Range	P.M.	Amount From Sec. Ft.	Amount To Sec. Ft.	
No. 21	2	Warrant, Barnes & Baxter	Arkansas River	Apr. 1861	9.0	34	20S	64W		0.8		
No. 21	2	Booth Ditch, Christian Fink Enlargement and Extension	Arkansas River	Apr. 1861	9.0	35	20S	64W			0.8	
No. 32	2	Warrant, Barnes & Baxter	Arkansas River	Apr. 1861	9.0	35	20S	66W		2.0		
No. 32	2	Bessemer	Arkansas River	Apr. 1861	9.0	35	20S	64W			2.0	
No. 61	3	Arkansas Valley Irrigating	Arkansas River	Jul.22/61	2.0	15	19S	69W		2.0		
No. 61	3	Colorado Fuel & Iron Co.	Arkansas River	Jul.22/61	2.0	1	21S	62W			2.0	
No. 57	4	Excelsior	Arkansas River	Dec. 1861	60.0	35	20S	66W		20.0		
No. 57	4	Bessemer	Arkansas River	Dec. 1861	60.0	32	20S	65W			20.0	
No. 58	4	Excelsior	Arkansas River	Dec. 1861	60.0	17	21S	61W		40.0		
No. 58	4	Rocky Ford High Line	Arkansas River	Dec. 1861	60.0	32	20S	63W			40.0	
No. 61	9	Arkansas Valley Irrigating	Arkansas River	1863	48.0	15	19S	69W		48.0		
No. 61	9	Colorado Fuel & Iron Co.	Arkansas River	1863	48.0	1	21S	62W			48.0	
99	10	C. L. Barnard	Fontaine qui Bouille	Feb. 1864	0.6	6	19S	64W		0.6		
99	10	McNeil	Fontaine qui Bouille	Feb. 1864	0.6	31	18S	64W			0.6	
No. 61	12	Arkansas Valley Irrigating	Arkansas River	1864	20.0	15	19S	69W		20.0		
No. 61	12	Colorado Fuel & Iron Co. D.1	Arkansas River	1864	20.0	1	21S	62W			20.0	
104	14	Cossens	Fontaine qui Bouille	Feb.10/66	0.4	7	20S	64W		0.4		
104	14	Chilcott	Fontaine qui Bouille	Feb.10/66	0.4	15	20S	65W			0.4	
171	16½	Rogers	Arkansas River	June 1866	5.0	35	20S	66W		5.0		
171	16½	Bessemer	Arkansas River	June 1866	5.0	35	20S	66W			5.0	
112	20	Enterprise	Arkansas River	Fall '67	14.0	31	21S	60W		13.4		
112	20	Oxford Farmers	Arkansas River	Fall '67	14.0	31	21S	60W			13.4	
112	20	Enterprise	Arkansas River	Fall '67	14.0	17	21S	61W		0.6		
112	20	Rocky Ford High Line	Arkansas River	Fall '67	14.0	31	21S	60W			0.6	
No. 9	25	Hallow Hill	Arkansas River	Jul.1/69	16.0	17	21S	61W		16.0		
No. 9	25	Rocky Ford High Line	Arkansas River	Jul.1/69	16.0	6	21S	62W			16.0	
No. 29	27	Hump-Bell	Arkansas River	Nov. 1870	2.5	35	20S	66W		1.47		
No. 29	27	Bessemer	Arkansas River	Nov. 1870	2.5	36	20S	66W			1.47	

STATE ENGINEER OF COLORADO

TRANSFER

DITCH DECREES

DISTRICT NO. 14 DIVISION NO. 2 COUNTIES PUEBLO, FREMONT, EL PASO, EL PASO, TELLER

Page	Priority Number	Name of Ditch	Appropriation			Location				Transfers		Remarks
			Source	Date	Amount Decreed Sec. Ft.	Sec.	Twp.	Range	P.M.	Amount From Sec. Ft.	Amount To Sec. Ft.	
126	34	Morey	Arkansas River	Apr.1/74	1.0	31	20S	65W		1.0		
126	34	West Pueblo	Arkansas River	Apr.1/74	1.0	27	20S	65W			1.0	
No. 29	36	Hamp-Bell	Arkansas River	1878	0.7	33	20S	66W		0.41		
No. 29	36	Bessemer	Arkansas River	1878	0.7	36	20S	66W			0.41	
126	35	Haden	Arkansas River	Oct.1/78	0.6	31	20S	65W		0.6		
126	35	West Pueblo	Arkansas River	Oct.1/78	0.6	27	20S	65W			0.6	
104	37	Cozzens	Fontaine qui Bouille	1879	1.6	7	20S	64W		1.6		
104	37	Chilcott	Fontaine qui Bouille	1879	1.6	13	20S	65W			1.6	
132	39	T. J. Steele	Fontaine qui Bouille	Feb.1/80	0.4	24	19S	65W		0.4		
132	39	Hobson No. 2	Fontaine qui Bouille	Feb.1/80	0.4	24	19S	65W			0.4	
165	42½	Cawlfield No. 2	Arkansas River	Mch. 1882	8.0		21S	62W		8.0		
165	42½	Collier	Arkansas River-	Mch. 1882	8.0		21S	62W			8.0	
126	45	Haden	Arkansas River	1883	0.4	31	20S	65W		0.4		
126	45	West Pueblo	Arkansas River	1883	0.4	27	20S	65W			0.4	
144	50	Allen	Arkansas River	Mch.11/86	2.0	17	21S	61W		2.0		
144	50	Rocky Ford High Line	Arkansas River	Mch.11/86	2.0	16	21S	61W			2.0	
165	53½	Cawlfield No. 2	Arkansas River	Mch.10/87	4.0		21S	62W		4.0		
165	53½	Collier	Arkansas River	Mch.10/87	4.0		21S	62W			4.0	
No. 59	55	Bessemer	Arkansas River	May 1/87	364.0	32	20S	65W		20.0		
No. 59	55	Excelsior	Arkansas River	May 1/87	364.0	35	20S	65W			20.0	
No. 59	60	Rocky Ford High Line Canal	Arkansas River	Jan.6/90	418.0	32	20S	65W		40.0		
No. 59	60	Excelsior	Arkansas River	Jan.6/90	418.0	17	21S	61W			40.0	
144	61	Allen	Arkansas River	1890	2.5	17	21S	61W		2.5		
144	61	Rocky Ford High Line	Arkansas River	1890	2.5	16	21S	61W			2.5	
No. 21	65	Booth Ditch, Christian Fink Enlargement and Extension	Arkansas River	Apr. 1892	3.2	35	20S	64W		0.8		
No. 21	65	Warrant, Barnes & Baxter	Arkansas River	Apr. 1892	3.2	34	20S	64W			0.8	

STATE ENGINEER OF COLORADO

TRANSFER

DITCH DECREES

DISTRICT NO. 14 DIVISION NO. 2 COUNTIES CUSTER, TELLER, PUEBLO, FREMONT & EL PASO.

Page	Priority Number	NAME OF DITCH	APPROPRIATION			LOCATION				TRANSFERS		REMARKS
			Source	Date	Amount Decreed Sec. Ft.	Sec.	Twp.	Range	P.M.	Amount From Sec. Ft.	Amount To Sec. Ft.	
No. 61	3	Arkansas Valley Irrigating	Arkansas River	Jul 22/61	2.0	13	19S	69W	6th	2.0		
No. 61	3	Colorado Fuel & Iron Co.	Arkansas River	Jul 22/61	2.0	1	21S	62W	6th		2.0	See Dist.#12
No. 61	9	Arkansas Valley Irrigating	Arkansas River	1863	48.0	13	19S	69W	6th	48.0		
No. 61	9	Colorado Fuel & Iron Co.	Arkansas River	1863	48.0	1	21S	62W	6th		48.0	See Dist.#12
No. 61	12	Arkansas Valley Irrigating	Arkansas River	1864	20.0	13	19S	69W	6th	20.0		
No. 61	12	Colorado Fuel & Iron Co.	Arkansas River	1864	20.0	1	21S	62W	6th		20.0	See Dist.#12
No. 52P	67 D	Palmer	Turkey Creek	Jul/23/96	0.5	1	19S	67W	6th	0.5		See Bean Ditc
No. 52R	67 D	Bean	Turkey Creek	Jul/23/96	0.5	1	19S	67W	6th	-	0.5	Page 199
No. 317	20	(12th Dist.) Canon City & Oil Creek	Arkansas River	May 31/64	14.2	33	20S	66W	6th	3.74		
No. 317	20	Bessemer	Arkansas River	May 31/64	14.2	33	18S	70W	6th		3.74	
No. 317	34	(12th Dist.) Canon City or Oil Creek/	Arkansas River	May 31/67	19.4	33	20S	66 W	6th	5.13		
No. 317	34	Bessemer	Arkansas River	May 31/67	19.4	32	18S	70 W	6th		5.13	

STATE ENGINEER OF COLORADO

RESERVOIR DECREES

DISTRICT NO. 14 DIVISION NO. 2 COUNTIES CUSTER & TELLER, PUEBLO, FREMONT, EL PASO

Page	Priority Number	NAME OF RESERVOIR	SOURCE OF SUPPLY	DECREES			LOCATION				REMARKS
				Date	Depth Feet	Amount Cubic Feet	Sec.	Twp.	Range	P.M.	
96	1	Greenview	Fontaine qui Bouille			2,615,600					
171	1½	Cape Horn Ranch	Arkansas River			1,100,000					
139	2	Pueblo Water Co's No. 1	Arkansas River			679,000					
139	3	Pueblo Water Co's No. 2	Arkansas River			767,180					
139	4	Pueblo Water Co's No. 3	Arkansas River			955,441					
150	5	McElroy Ditch	Fontaine qui Bouille			150,000					
168	5½	Trustees of Pueblo Water W.#1	Arkansas River			1,740,000					
168	5½	Trustees of Pueblo Water W.#2	Arkansas River			1,760,000					
151	6	Reservoir No. 9	Arkansas River			38,500,000					
115	7	Olin Ditch No. 1	Fontaine qui Bouille			180,000					
115	8	Olin Ditch No. 2	Fontaine qui Bouille			180,000					
196	9	Harman	Fountain Creek	1891		566,280					
218	10	Lake Henry	Arkansas River	1891		276,734,800	31 32	20S	56W		
219	11	Lake Meredith	Arkansas River	Mch/9/98		907,935,390					
202	12	Pueblo Water Supply& Power Co.	Fountain River	May/10/02		2,773,176	11	20S	64W		
204	13	Gains	Red Creek	Jun/1/03		1,749,600					
206	14	Dotson	Chicosa Creek	Oct/1/03		84,712,300					
207	15	Dotsón Reservoir Enlg.	Chicosa Creek	Jun/15/06		104,819,700					
207	16	Chicosa No. 5	Chicosa Creek	Jun/15/06		50,583,800					
210	17	Potter-Turkey Creek	Turkey Creek	Jul/30/08		21,780,000					
216	18	Nyberg	Chico Creek	Jan/1/13		2,608,000					
226 233	1	H.O.P. No. 1	Spring Branch	Jun.1/80		30,000	28	17S	65 W	6th	
226 233	2	H.O.P. No. 2	Spring Branch	Jun.1/88		25,000	28	17S	65 W	6th	
226 233	3	H.O.P. No. 3	Spring Branch	Jun.1/92		25,000	28	17S	65 W	6th	
226 233	4	Smith No. 1	Spring Branch	Apr.7/02		266,666	5	18S	65 W	6th	
226 233	5	H.O.P.	Spring Branch	Dec.28/02		33000,000	32 33	17S	65 W	6th	
226 233	6	Smith No. 2	Spring Branch	Mar.1/02		133,333	5	18S	65 W	6th	
226 233	7	Curiton	Spring Branch	Mar.15/03		300,000	32	17S	65 W	6th	

SUMMARY OF DITCH AND RESERVOIR FILINGS OF BIENNIAL PERIOD

District Number	No. of Ditches	Total amount claimed for Ditches, Cubic feet per second	No. of Reservoirs	Total amount claimed for Reservoirs, Cubic feet	Estimated cost of Construction of Ditches	Estimated cost of Construction of Reservoirs
I	111	956,61	40	2,148,871,934	$198,595.00	$139,020.00
II	116	1,044.60	23	1,222,231,072	107,792.00	238,700.00
III	50	473.86	10	263,104,423	60,400.00	52,500.00
IV	176	904.13	12	107,098,345	156,769.00	20,800.00
V	143	829.42	44	396,014,369	231,704.00	226,193.00
Total	596	4,208.62	129	4,137,320,143	$755,260.00	$677,213.00

CHAPTER VI

APPEALS

The only case of importance coming before this office for decision during the biennial term was that of an appeal of the North Poudre Irrigation Company from the order of the Division Engineer, F. Cogswell, in the fall of 1917. The Findings and Order of the State Engineer are given herewith.

FINDINGS AND ORDER OF STATE ENGINEER

In the matter of an appeal from the order of Division Engineer, F. Cogswell,

By the North Poudre Irrigation Company.

On September 26, 1917, F. Cogswell, Irrigation Division Engineer for Irrigation Division No. 1, mailed to John L. Armstrong, Water Commissioner of District No. 3, one of his standard forms of notice relative to the diversion of water for ditches and reservoirs in Irrigation District No. 1, in which there appears the following language:

> "You are also instructed not to distribute water in any reservoir that has been full *once this calendar year.*"

On October 1, 1917, the North Poudre Irrigation Co., by R. W. Fleming, its counsel, appealed from the order of the Division Engineer above quoted to the State Engineer and prayed that the order be rescinded and that the Division Engineer be ordered to allow diversions of water for storage from the Cache la Poudre river in the order of priority of appropriation.

The appeal by the North Poudre Irrigation Co. reads as follows:

> "Said order, *inter alia,* directs Water Commissioner of District No. 3 with reference to his official duties as follows:
>
> " 'You are also instructed not to distribute water to any reservoir that has been full once this calendar year.'
>
> "That said order is contrary to law, contrary to the established custom under which appellant received the decrees, and highly injurious to appellant's property rights in this:
>
> "(a) All irrigation reservoirs have been full during the present calendar year, but for the most part have been emptied for irrigation purposes during the last crop season. However, those of earlier date have not been filled during the present calendar year, but the amount of water in them for use last summer was largely contributed to by water stored in them in

> the fall of 1916. These reservoirs so emptied or depleted are now entitled to store water according to priority for irrigation uses next summer. No decrees have ever been made with reference purely to the calendar, but all are made with reference to irrigation uses, established customs, and the status which existed prior to the decree, and are intended to preserve such rights and as far as possible to further a proper conservation and economical use of water. The reservoirs of appellant have been built up on the basis of fall storage. This system has proved itself, and the order in question is direct confiscation.
>
> "(b) The order disregards the rule of priority, because it obliges a senior empty reservoir to surrender water to all users which are junior, whether their rights are decreed or undecreed. It is possible under this order (and such is its apparent purpose) for a reservoir built last year to be filling now with water for use next summer, while a senior entirely empty is deprived of the right to fill for the same use next summer, and thus arbitrarily the senior is set behind the youngest junior, and the junior for a period is made senior to the oldest decree, although the water the junior is taking is emphatically needed by the senior for the same purposes and use at the same time as will be enjoyed by the junior.
>
> "(c) Every reasonably informed citizen of Colorado knows, or should know, that water is stored in reservoirs for use during the growing season upon crops. That when the water has been so used, the purpose of the filling is accomplished and the reservoir, if its usefulness is to be continued, must then be filled according to date of priority and availability of water for use the following growing season. That this has been the practice in Colorado from time immemorial.
>
> "This order arbitrarily and unreasonably disregards not only the law, but the common knowledge and judgment of mankind.
>
> "Therefore, your appellant respectfully requests that said order be rescinded and set aside."

Due notice was given to the Division Engineer and other interested parties and hearing had pursuant to statute, on the 8th day of October, 1917.

The records of this office reveal that former opinions were handed down in similar appeals on September 28, 1915, and October 18, 1913, wherein similar orders of the Division Engineer were upheld, but with all due respect to previous State Engineers, I am convinced that the objections of the North Poudre Irrigation Co. are well founded; that the order limiting reservoirs to one filling in each calendar year is in direct violation of the fundamental rule of prior appropriation and is contrary to the constitution and statutes of this state and without statutory or other authority; that while by the decisions of the Supreme Court of this state (44 Colo. 214) reservoirs are limited to one filling during each season or year in their order of priority, nevertheless it appears from such opinion that the word "year" is there used synonymously with the word "season" (44 Colo. 223) and that the rules there announced were not intended to violate the fundamental doctrine of prior appropriation, but on the contrary to uphold the same.

I cannot agree with a former State Engineer that a seasonal year, so-called, would not be as acceptable to all reservoir interests of the state as the calendar year, and would not lead to chaos and dissatisfaction in the administration of reservoir decrees. It is well known that many of the reservoirs of the state procure most of their supply of water in the fall and winter, after the crop season is passed, for use on the crops of the following crop season and it would be a violation of the law of priority to give a ditch having a junior decree water for direct irrigation and deprive a senior reservoir of the right to store, for such direct irrigation could only be in preparation for next season's crop and, consequently, is only another method of storage.

In view of the foregoing, the State Engineer hereby issues the following order:

(1) That the order of Division Engineer F. Cogswell of date September 27, 1917, and all like previous or present orders, be and the same are hereby overruled and rescinded;

(2) That water shall be distributed to reservoirs in their order of priority of appropriation as fixed by the decrees by the District Courts in the several districts of Irrigation Division No. 1, with the qualification that but one filling of each reservoir shall be permitted, unless second filling may occur without detriment to any other appropriations upon the stream, during any one season or year, and that the season or year is hereby determined to begin as soon as water shall be available in the fall of each year and shall terminate on the like date of the succeeding year.

It is further ordered that the provisions of this order shall be carried out and enforced impartially with due regard to the legal rights and priorities of all appropriators in Irrigation Division No. 1.

ADDISON J. McCUNE,
State Engineer.

CHAPTER VII

ANNUAL REPORTS OF DIVISION ENGINEERS

ANNUAL REPORT IRRIGATION DIVISION ENGINEER DIVISION NO. 1—1917

November 30, 1917.

Mr. A. J. McCune,
State Engineer,
Denver, Colorado.

Dear Sir: I herewith submit my report of the work of irrigation Division No. 1, during the fiscal year ending November 30, 1917.

I note in the Session Laws of 1917, page 43, that the State Auditing Board must authorize how much of the biennial reports shall be printed.

I would suggest, that to receive consideration, the reports of the Division Engineers should be limited to 500 words in addition to the necessary tabulation of the Water Commissioners' annual reports.

Spring conditions were very unfavorable and plowing and planting were delayed. At the end of May both farm work and vegetation were more backward than for many years.

June, after the first week, was very dry, being the driest June of record except June of 1916.

At the end of May the precipitation was 1.46 inches above normal, but during June, July and August there was a deficiency.

At the present writing the deficiency for the state is about 4.50 inches.

No new questions relative to the distribution of water have been presented to this office during the season just past.

During the winter of 1916 and 1917, Lake Cheesman discharged from storage about 14,000 acre-feet to supply the shortage in the river for the domestic use of Denver and for power purposes of the flour mill at Littleton. On March 28, she commenced to refill and was reported full on May 13.

An order was issued on May 3 to allow storage in Antero Reservoir.

The first use of water for direct irrigation was reported under the O'Brian Canal in District No. 2 during the week ending April 7th.

The Water Commissioner of District No. 1 reported for week ending April 28, that the South Platte River was dry below the headgates of the Bijou and Ft. Morgan ditches and the Point of Rocks Reservoir diversion dam. There was also a shortage of 500 second-feet for storage in Riverside and Jackson Lake Reservoirs.

During May, owing to the high rivers and excessive rainfall, there was more water in the South Platte River than was needed for direct irrigation, or could be stored in the reservoirs as they were well filled by May 15th. During the last half of May and the first half of June, about 10,000 second-feet were reported passing from District No. 1 into No. 64.

The "Highline" Canal in District No. 8 broke at the flume over Plum Creek on June 24th while diverting 600 second-feet. Repairs were completed and water again diverted on July 1st.

The first demand for water was received on July 6th from District No. 2 for 335 second-feet to supply decreed appropriations of later date than July 8, 1879.

The first use of reservoir water *via* the river was reported by District No. 3 during the week ending July 14th.

The Water Commissioners of Districts Nos. 1, 2 and 64 on October 11 reported that the demands of all their ditches for direct and immediate irrrigation were supplied.

On October 13th orders were sent to Districts Nos. 1 to 9 and 64, to distribute the water in their districts to the ditches and reservoirs in accordance with the dates of their decreed appropriations.

The Water Commissioner of District No. 8 reported for week ending October 27th that all of his ditches were supplied.

On October 31st, permission was given to store water in Lake Cheesman.

At date of writing a non-storage order is in force against Antero Reservoir.

I hereto attach the regular statutory tabulation of Water Commissioners' annual reports.

Respectfully submitted,

F. COGSWELL,
Irrigation Division Engineer,
Irrigation Division No. 1.

IRRIGATION DIVISION NO. 1

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL RESERVOIR REPORTS FOR THE IRRIGATION SEASON OF 1917.

District	Number of Reservoirs Reported	Capacity in Acre-Feet	Area of High Water Line Acres	Quantity of Water in Reservoirs May 1, 1917 Acre Ft.	Quantity of Water in Reservoirs Nov. 1, 1917 Acre Ft.	Quantity of Water Held Over from Nov. 1, 1916 Acre Ft.
1	4	9,914	139,982	127,272	34,500	30,971
2 (A)	30	6,884	125,087	67,320	7,580	12,924
3	54	10,091	156,948	84,182	42,562	29,846
4	15	4,934	94,940	55,193	39,738	47,200
5	19	2,960	32,214	30,608	9,586	21,336
6	30	3,007	42,796	23,749	12,995	4,944
7	45	Not reported	19,078	16,139	344	112
			(All in C	astlewood	Reservoir)	
8	1	175	(5,257	1,500	0)	927
	Marston	Lake n	ot inclu	ded. Used	by D. U.W	ater Co.
	for	domes	tic pur	poses.		
*9	17	872	11,033	11,033	432	1,000
						76,976
23 (B)	3	5,027	138,340	81,816	79,137	
46		No res	ervoirs	reported		
47		No res	ervoirs	reported		
48	2	75	382	149	115	149
64 (C)	3	6,981	141,600	83,114	36,504	14,463
65	3	64	528	Not reported		69
Totals	226	50,984	908,185	582,075	263,493	240,917
*Marston Lake		651	19,795	19,795	124	0

These "Annual Reports" of the Water Commissioners include many small reservoirs not included in their weekly reports.

(A) District No. 2 includes storage in Standley Lake.

(B) District No. 23, Antero Reservoir reported capacity 58,601 acre-feet at gage rod of 30 feet as high water line.

(C) District No. 64 includes storage in Point of Rocks and Prewitt Reservoirs, and Julesburg Reservoir.

IRRIGATION DIVISION NO. 1

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

(1) District	(2) Amount of Appropriation in Second Feet	(3) Capacity of Ditches in Second Feet	(4) Length of Main Diches in Miles	(5) Length of Laterals in Miles	(6) First Day Water Diverted From Natural Streams for Irrigation
1...............	2,850	2,481	362	299	April 1
2...............	3,355	2,334	292	Not reported	April 1
3...............	3,777	3,319	368	1,278	May 14
4...............	2,645	2,558	239	152	May 13
5...............	2,318	1,714	249	251	April 3
6...............	2,306	1,847	258	110	May 7
7...............	1,694	1,670	224	83	April 19
8...............	1,980	1,342	278	391	March 25
9...............	380	345	54	45	May 5
		Only 51 di	tches repo	rted out o	f a total of
23...............	912	374 decree	d appropri	ations	May 1
46...............	1,921	1,838	172		May 1
47...............	Water Co	mmission	er reports	he was no	t on duty as
	there was	an abunda	ance of w	ater.	
48...............	3,211	675	124		May 10
64...............	3,862	3,617	296	387	March 22
65...............	172	247		Not reported	April 15
Totals....	31,383	23,987	2,916	2,996	

IRRIGATION DIVISION NO. 1

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

District	(7) Last Day Water Diverted from Natural Streams for Irrigation	(8) Maximum No. of Days Water Diverted from Natural Streams for Irrigation	(9) Maximum No. of Days Water Carried from Reservoirs	(10) Amount of Water Carried from Reservoirs in Acre Feet (See Note)
1	Nov. 1	214	127	87,871
2	Nov. 1	214	133	(A) 65,190
3	Sept. 29	139	Not reported	122,045
4	Oct. 27	168	153	46,003
5	Oct. 27	208	58	(A) 19,568
6	Oct. 20	167	126	30,954
7	Oct. 29	194	Not reported	(A) 22,048
8	Nov. 5	226	Castlewood Reservoir	2,150
9	Nov. 20	230	Not reported	12,855
23	Aug. 5	97	90	(B) 22,893
46	Oct. 15	168	No reservoi	rs reported
47	Water Commis	sioner not on	duty. Abun	dance water.
48	Oct. 25	169	Not reported	
64	Nov. 1	224	93	74,544
65	Nov. 1	200	28	Not reported
Totals		244	808	506,121

NOTE.—The quantities in column (10) represent the reported acre-feet in the reservoirs on May 1, 1917, minus the acre-feet reported in the reservoirs on November 1, 1917, plus the acre-feet diverted from the rivers for storage from May 1 to November 1 as given in the weekly reports of the Water Commissioners, except in Districts 1, 3, 8 and 64, which are given as reported by the Water Commissioners.

The "Annual Reports" of the Water Commissioners include many small reservoirs not included in their weekly reports. These quantities are, therefore, only approximate, but they are the only ones available.

(A) District No. 2 diverted 3,238 acre-feet from No. 5 and 255 acre-feet from No. 7, which are not included in column (10), but are included in column (12) for District No. 2.

District No. 2 includes storage in Standley Lake.

(B) District No. 23; the 22,893 acre-feet were diverted for use in Districts Nos. 2 and 8 by the Burlington, Highline and D. U. Water Co.

District No 64 includes storage in Point of Rocks and Prewitt Reservoirs, and in Julesburg Reservoir.

IRRIGATION DIVISION NO. 1

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

District	(11) Average Daily Amount of Water Diverted by Ditches During Season from Natural Streams for Irrigation Second Feet	(12) No. of Acre-Feet Diverted by Ditches During Season from Natural Streams for Irrigation (See Note)	(13) Total No. of Acres That Can be Irrigated (See Note)	(14) Crops Irrigated, Etc.	(15)
				Alfalfa	Natural Grasses
1	1,346	321,810	147,550	31,150	10,200
2	1,022	303,813	154,289	24,524	3,080
3	1,587	326,810	391,840	65,975	6,595
4	672	171,952	118,705	28,825	325
5	576	120,322	101,900	27,166	7,104
6	678	90,660	99,133	30,915	9,560
7	466	121,970	116,030	39,895	2,005
8	378	142,862	122,556	17,369	1,373
9	145	36,363	20,997	7,904	3,116
23	433	56,908	16,110		16,040
46	1,486	123,799	90,270		89,624
47	Water commi	ssioner not	on duty. Ab	undance	of water.
48	Not re	ported	11,966	13	5,521
64	926	190,617	190,231	33,735	22,238
65	59	3,544	3,166	1,049	567
Totals....	9,774	2,011,430	1,584,743	308,520	177,348

NOTE.—The quantities given in columns (13) to (25) represent the total acreage that can be irrigated or was irrigated, whether the ditches only used the natural flow of streams, or only used reservoir water, or used river and reservoir water combined.

The approximate amount of water used in any district, except in District No. 3, will be found by adding together the "No. of acre-feet diverted by ditches during season from natural streams," given in column (12), and the "Amount of water carried from reservoirs in acre-feet," given in column (10).

In District No. 2, 4,113 acre-feet were diverted from Districts Nos. 5, 7 and 23, and are included in column (12) for District No. 2.

In District No. 3, 20,014 acre-feet additional were diverted from Districts Nos. 47, 48 and 51, and used for direct irrigation.

In District No. 7, 504 acre-feet were diverted from District No. 51 and used by Golden City and Ralston Creek Ditch, and are included in column (12) for District No. 7.

In District No. 8, 13,100 acre-feet were diverted from District No. 23, and distributed to the Highline Canal, and are included in Column (12) for District No. 8.

IRRIGATION DIVISION NO. 1

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917

District	(16) Cereals	(17) Orchards	(18) Market Gardens	(19) Potatoes	(20) Sugar Beets	(21) Other Crops
1	26,310	150	135	1,580	23,190	6,540
2	38,538	215	7,414	6,408	22,411	1,059
3	87,144	2,402	1,626	36,248	42,520	9,000
4	58,575	1,752	95	3,365	19,215	925
5	40,016	785	180	718	13,711	3,358
6	37,021	1,651	988	1,243	11,710	3,865
7	40,885	5,270	11,200	165	1,055	30
8	23,465	1,383	1,780	364	850	705
9	5,455	391	61	33	108	954
23						70
46	645		1	(36,635 acres of the "Natural Grasses" are reported as "Pasture')		
47	Water C	ommissi	oner not	on duty. Abundance of water.		
48				1		
64	33,676	192	383	2,212	20,948	2,425
65	296	36	14	50	2	50
Totals	392,026	14,227	23,877	52,387	155,720	28,981

IRRIGATION DIVISION NO. 1

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917

CROPS IRRIGATED FROM CANALS IN ACRES					COST IN DOLLARS		
District	(22) Corn	(23) Miscellaneous	(24) Beans	(25) Total Irrigated	(26) Superintendence	(27) Repairs	(28) Improvements
1	....	....	....	99,255	10,285	4,360	11,700
2	2,577	Cab'ge 1,200	16,392	123,818	17,556	8,450	6,258
3	....	....	....	251,510	7,670	5,750	....
4	....	Peas 1,030	2,505	116,612	12,420	1,350	2,700
5	....	....	230	93,268	4,859	21,034	1,150
6	....	....	....	96,953	4,980	21,365	9,500
7	....	Onions 40	305	100,850	Not	reported	
8	....	Celery 50	....	47,339	17,622	17,139	6,521
9	....	Dry Land 586	....	18,608	3,080	1,510	300
23	....	....	....	16,110	Not	reported	
46	....	....	....	90,270	Not	reported	
47	Water	Comm	issione	r not on d	uty. A	bundan	ce water.
48	....	....	....	5,535	....	946	135
64	....	....	1,777	117,586	18,420	17,516	19,082
65	141	Cane 86	....	2,291	....	795	150
Totals	2,718	2,992	21,209	1,180,005	96,892	100,215	57,496

ANNUAL REPORT DIVISION ENGINEER

DIVISION NO. 1—1918

Denver, Colorado, November 30, 1918.

Mr. A. J. McCune,
State Engineer,
Denver, Colo.

Dear Sir: I herewith submit my report of the work of Irrigation Division No. 1 during the fiscal year ending November 30, 1918.

* * * * * * * * * * *

The warm weather and ample precipitation during March put the ground in good condition for spring plowing and seeding and was favorable for the growth of winter grains.

Very little rain fell during April, May and the early part of June, and in the eastern portion of the division they were unusually dry months, with a rainfall of less than one-half the normal.

The high temperature and little or no rain during May and early June were unfavorable for winter wheat upon the dry farming lands, and all small grain suffered seriously from the dry weather.

July, on the other hand, was a record-breaker with a rainfall of about three inches and seventeen rainy days.

Lake Cheesman commenced to store water about March 1st, and was full on April 15th.

Antero Reservoir commenced to store water on April 4th, and storage was stopped on May 11th to supply the demands for direct irrigation in District No. 1.

The first general order to shut down ditches was issued May 7th to supply 720 second-feet for ditches in District No. 1, with appropriations of earlier date than January 1, 1889. On May 16th there was a shortage of 435 second-feet to supply the ditches in District No. 2 with appropriations of earlier date than January 1, 1879.

The first use of reservoir water for irrigation was reported from Districts Nos. 1, 3 and 64, for week ending May 25th.

On June 10th reports were received of floods in the Big Thompson, St. Vrain and Clear Creeks, due to heavy rains in the mountains.

On June 15th the Water Commissioner of District No. 64 came to the office and reported a shortage for his 1882 appropriations, and a large amount of flood water in the upper portion of District No. 1.

In the afternoon we inspected, by auto, the ditches in District No. 1 and found that the flood waters from Districts Nos. 3, 4, 5 and 7 had reached Weldona, enough to supply all appropriations prior to January 1, 1900.

On June 16th, 'phone orders were issued to distribute water to decreed ditches and reservoirs of earlier date than January 1, 1900.

All decreed ditches and reservoirs were supplied by June 23, and undecreed water was distributed on that date to the O'Brian Canal.

Orders were issued on July 2 to close all ditches post-dating January 1, 1879, in Districts Nos. 7, 8, 9, and 23 to supply District No. 2.

All water commissioners were notified on July 23 that they were at liberty to store any excess water in reservoirs that had been full once this year.

On August 1, there was again a shortage of water in District No. 2 for appropriations of earlier date than January 1, 1879.

On September 16, orders were issued allowing storage in reservoirs in accordance with the date of their decreed appropriations. These orders are still in force.

* * * * * * * * * * *

This order was first issued in 1912, and the annual reports of this office as published in the biennial reports of the State Engineers, show that permission was given to store water in reservoirs in accordance with the dates of their decreed appropriations, as follows: September 22, 1912; October 10, 1913; October 14, 1914; September 28, 1915; October 28, 1916; October 13, 1917; and September 16, 1918.

I hereto attach the regular statutory tabulation of the Water Commissioners' annual reports.

Respectfully submitted,

(Signed) F. COGSWELL,
Irrigation Division Engineer,
Irrigation Division No. 1.

IRRIGATION DIVISION NO. 1

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL RESERVOIR REPORTS FOR THE IRRIGATION SEASON OF 1918.

District	Number of Reservoirs Reported	Area of High Water Line Acres	Capacity in Acre Feet	Quantity of Water in Reservoirs May 1, 1918 Acre Feet	Quantity of Water in Reservoirs Nov. 1, 1918 Acre Feet	Quantity of Water Held Over from Nov. 1, 1917 Acre Feet
1 (A)	4	9,914	139,982	100,893	34,233	34,500
2 (B)	29	6,834	125,085	70,667	24,862	7,580
3	60	10,140	162,378	91,095	54,603	42,562
4	15	4,935	94,930	50,824	51,296	39,738
5	19	2,960	32,281	27,918	22,417	9,586
6	28	2,682	41,855	32,450	14,802	12,995
7	No annu	al repo	rt receiv	ed		344
		(All	in Castle	wood Res	ervoir)	
8	1	175	3,434	1,756	746	0
	(Marsto	n Lake	not incl	uded. Use	d by D. U.	Water Co.
	for dom	estic p	urposes)			
9*	17	872	11,033	11,033	9,980	432
23 (C)	4	5,222	149,818	106,493	108,378	79,137
46	No annu	al repo	rt receiv	ed		
47	No reser	voirs r	eported			
48	No annu	al repo	rt receiv	ed		
64 (D)	3	7,081	141,370	90,466	50,323	36,504
65	5	102	983	521	512	Not reported
Totals	185	50,917	903,149	584,116	372,152	263,493
*Marston	Lake	651	19,795	19,795	19,795	124

These "Annual Reports" of the Water Commissioners include many small reservoirs not included in their weekly reports.

(A) District No. 1 compiled from the records of this office.

(B) District No. 2 includes storage in Standley Lake.

(C) District No. 23 compiled from the records of this office. No annual report received from the Water Commissioner.

(D) District No. 64 includes storage in Point of Rocks and Prewitt Reservoirs, and Julesburg Reservoir.

IRRIGATION DIVISION NO. 1

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

(1) District	(2) Amount of Appropriation in Second Feet	(3) Capacity of Ditches in Second Feet	(4) Length of Main Ditches in Miles	(5) Length of Laterals in Miles	(6) First Day Water Diverted from Natural Streams for Irrigation
1..............	2,850	2,481	362	299	April 8
2..............	3,355	2,433	274		May 1
3..............	3,895	3,420	358	1,292	April 29
4..............	2,645	2,558	239	157	May 1
5..............	2,318	1,737	249	253	May 6
6..............	2,183	1,848	259	121	May 1
7..............	No annual	report rece	ived		
8..............	1,293	1,296	241	372	March 1
9..............	384	345	54	47	March 1
23..............	No annual	report rece	ived		
46..............	No annual	report rece	ived		
47..............	The Water	Commissio	ner only re	ports rela	tive to 29
	ditches out	of a total o	f 371 decre	ed approp	riations.
48..............	No annual	report rece	ived		
64..............	3,729	3,057	331	270	March 19
65..............	94	194	Not re	ported	April 27
Totals	22,746	19,369	2,367	2,811	

IRRIGATION DIVISION NO. 1

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

District	(7) Last Day Water Diverted from Natural Streams for Irrigation	(8) Maximum No. of Days Water Diverted from Natural Streams for Irrigation	(9) Maximum No. of Days Water Carried from Reservoirs	(10) Amount of Water Carried from Reservoirs in Acre Feet (See Note)
1	October 31	207	134	145,240
2	October 31	184	135	(A) 49,089
3	September 27	152	Not reported	132,971
4	November 8	192	121	29,314
5	October 31	179	28	14,191
6	November 5	189	Not reported	26,594
7	No annual repo	rt received		
			Castlewood	Reservoir
8	November 9	254	101	2,424
9	November 18	263	Not reported	4,745
23	No annual repo	rt received		(B) 22,769
46	No annual repo	rt received		
47			No rese	rvoirs
48	No annual repo	rt received		
64	October 31	227	64	62,615
65	November 15	203	120	Not reported
Totals		263	743	489,952

NOTE.—The quantities in column (10) represent the reported acre-feet in the reservoirs on May 1, 1918, minus the acre-feet reported in the reservoirs on November 1, 1918, plus the acre-feet diverted from the rivers for storage from May 1 to November 1, as given in the weekly reports of the Water Commissioners, except in Districts 2, 3, 4, 8, and 64, which are given as reported by the Water Commissioners.

The "Annual Reports" of the Water Commissioners include many small reservoirs not included in their weekly reports. These quantities are, therefore, only approximate but they are the only ones available.

(A) District No. 2 diverted 6,760 acre-feet from District No. 23, which are not included in column (10).

District No. 2 includes storage in Standley Lake.

(B) District No. 23; the 22,769 acre-feet were diverted for use in Districts Nos. 2 and 8 by the Burlington, Highline, and D. U. Water Company.

District No. 64 includes storage in Point of Rocks and Prewitt Reservoirs, and in Julesburg Reservoir.

IRRIGATION DIVISION NO. 1

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

District	(11) Average Daily Amount of Water Diverted by Ditches During Season from Natural Streams for Irrigation Sec. Ft.	(12) No. of Acre Ft. Diverted by Ditches During Season from Natural Streams for Irrigation (See Note)	(13) Total No. of Acres That Can be Irrigated (See Note)	(14) Crops Irrigated, Etc.	(15)
				Alfalfa	Natural Grasses
1	1,114	281,124	139,750	33,900	8,550
2	1,068	337,526	138,571	24,011	2,585
3	1,476	315,860	397,550	68,385	6,460
4	602	142,198	118,705	24,900	245
5	469	91,886	102,038	26,590	7,139
6	639	117,064	105,890	30,235	8,925
7	No annual re	port received			
8	423	132,088	114,755	14,895	1,507
9	133	38,396	21,375	7,563	2,793
23	No annual re	port received			
46	No annual re	port received			
47					9,675
48	No annual re	port received			
64	829	183,098	190,585	31,830	23,777
65	Not re	ported	3,795	1,219	872
Totals......	6,753	1,639.240	1,333,014	263,528	72,528

NOTE.—The quantities given in columns (13) to (25) represent the total acreage that can be irrigated or was irrigated, whether the ditches only used the natural flow of streams, or only used reservoir water, or used river and reservoir water combined.

The approximate amount of water used in any district, except in Districts 2, 3, and 8, will be found by adding together the "No. of Acre-Ft. Diverted by Ditches During Season from Natural Streams," given in column (12) and the "Amount of Water Carried from Reservoirs in Acre-Ft," given in column (10).

In District No. 2, 6,760 acre-feet additional were diverted from District No. 23.

In District No. 3, 33,818 acre-feet additional were diverted from Districts Nos. 47, 48, and 51, and used for direct irrigation.

In District No. 7, 868 acre-feet were diverted from District No. 51 and used by the Golden City and Ralston Creek Ditch.

In District No. 8, 14,792 acre-feet additional were diverted from District No. 23 and distributed to the Highline Canal.

IRRIGATION DIVISION NO. 1

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

District	(16) Cereals	(17) Orchards	(18) Market Gardens	(19) Potatoes	(20) Sugar Beets	(21) Other Crops
1	30,110			2,120	17,874	7,127
2	58,740	215	8,735	5,758	18,191	14,900
3	95,077	2,432	1,646	36,190	40,520	9,140
4	68,255	1,485	105	2,415	13,895	940
5	43,861	705	195	1,003	9,992	4,797
6	41,185	1,563	792	1,165	12,165	2,575
7	No annu	al report	received			
8	23,687	1,232	1,699	360	945	505
9	5,978	292	109	21	48	930
23	No annu	al report	received			
46	No annu	al report	received			
47	1 re	850 acres ported a	of the "N s "Pastu	atural Gr re"	asses" are	
48	No annu	al report	received			
64	31,948	161	114	2,120	16,730	1,505
65	511	39	100	125	6	369
Totals	399,352	8,124	13,495	51,277	130,366	42,788

IRRIGATION DIVISION NO. 1

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

CROPS IRRIGATED FROM CANALS IN ACRES					COST IN DOLLARS		
District	(22) Corn	(23) Miscellaneous	(24) Beans	(25) Total Irrigated	(26) Superintendence	(27) Repairs	(28) Improvements
1	....	....	....	99,681	No	t report	ed
2	....	....	5,436	138,571	$ 29,130	$ 4,910	$ 2,120
3	....	....	....	259,850	No	t report	ed
4	....	Peas 620	4,390	117,250	15,340	1,100	3,250
5	....	....	....	94,282	Reports (26), (2	$30,275 7), and	for (28)
6	....	....	825	99,430	6,855	26,660	10,900
7	....	....	No ann	ual repor	t receiv	ed	
8	....	Celery 50	....	44,880	36,907	5,458	2,555
9	....	Dry Land 372	....	18,106	3,020	1,150	....
23	....	....	No ann	ual repor	t receiv	ed	
46	....	....	No ann	ual repor	t receiv	ed	
47	....	....	....	9,675	....	....	....
48	....	....	No ann	ual repor	t receiv	ed	
64	195	....	2,090	110,470	19,477	15,032	21,507
65	....	....	....	3,241	....	325	110
Totals	195	1,042	12,741	995,436	$110,729	$54,635	$40,442

ANNUAL REPORT DIVISION ENGINEER

DIVISION NO. 2—1917

Pueblo, Colo., December 8, 1917.

Hon. A. J. McCune,
State Engineer,
Denver, Colorado.

Dear Sir: I have the pleasure of submitting to you my report for the year ending November 30th, 1917, for Division No. 2, together with the tabulated sheets of the several Water Commissioners of this Division.

The past year was unusual in many respects. A very cold, dry winter, but little moisture, in fact the snow fall was exceedingly light.

Beginning with December, 1916, there was but .23 of an inch; January, .22; February, .49; March, .44. Then began a cold, wet spring continuing to June first, so unfavorable for preparation of the ground and planting, that some crops failed to come up and were abandoned, others replanted in the hopes something might be realized from them.

All this caused replanting, and late crops which suffered from the remarkable freeze of October the twenty-ninth.

The summer was usually dry. There were many local showers, and often very heavy rains covering small areas, so that the "big" rains were not general or widespread. There were no floods, no high water during the season. The water was used with more care and economy than ever before. There was sufficient in the irrigating ditches.

In my opinion this scarcity of water was a great benefit to the farmer and the land, more cultivation and less water resulting in better crops than ever before and less seepage.

Some remarkable crops were reported. For instance, under the Bessemer Ditch 85 to 110 bushels of corn per acre, also a published statement that a Mr. Dolan, of Rocky Ford, raised the remarkable amount of 3,500 pounds of beans to the acre and several others 2,500 pounds. Fifty to seventy bushels of wheat not infrequent in eastern part of the Division, sugar beets reported 24 to 28 tons in many instances and very rich in sugar content. The unheard of war prices for all farm produce is making the farmer feel the shade of "Easy Street."

Reservoirs—

Many of our reservoirs had a good supply to begin the season with, but almost all were exhausted, or nearly so, so that they now contain comparatively small amounts of water in storage. All are in good condition, both as to structure and measuring devices.

Canals—

Are in good condition, but deficient in measuring devices, the tendency is soon for all to be supplied with self-registering gages.

Rainfall—

For April, 1.39 inches; May, 3.01; June, .58; July, 1.32; August, 1.74; September, 3.25; October, .51, and November, .02.

* * * * * *

We have in this valley 527,490 acres that can be irrigated. Of this 464,391 acres are irrigated and producing over thirty millions per annum, not including live stock. To be more precise, I will enumerate some of the staple crops and their value. I will give conservative estimates, rather low than high (paid to the producer):

Sugar Beets—

50,266 acres, average 15 tons per acre, making 658,107 tons at $7.00 per ton equals $5,306,749.00.

Alfalfa—

219,369 acres at 3 tons per acre equals 658,107 tons at $20.00 per ton (now selling at $26.00 per ton) equals $13,162,140.00.

Beans—

14,981 acres at 1,000 pounds average per acre equals 14,981,000 pounds at 8c, $1,198,480.00.

Wild or Native Hay—

35,345 acres at 1½ tons per acre equals 53,107 tons at $20.00 per ton, $1,060,340.

Timothy Cultivated—

6,000 acres at 2½ tons per acre equals 15,000 tons at $20.00 per ton, $300,000.00.

Corn—

4,647 acres at 50 bushels per acre equals 232,350 bushels at $2.00 per bushel, $464,700.00.

Cereals (Wheat, Oats and Barley)—

91,713 acres at 40 bushels per acre equals 3,668,520 bushels at $2.00 per bushel, $7,337,040.00. Making a total of $29,546,640.00.

To this we must add the great melon crop, rarely equalled in quantity and price. About 2,000 acres of Kaffir corn and Milo

Maize, potatoes, the largest yield in many years and the finest grade; 1,200 acres market gardens, 800 acres for market garden seed alone; apples, a large yield, though not as heavy as some of the best years.

Cherries—

About 2,500 acres, and sold for 3½c to 4c net per pound at the canneries. There was a heavy crop throughout the valley.

Bush fruit and celery second to none as producers and money makers. (Add to this two carloads of honey.)

We can conservatively add one and one-half million to the above, making a grand total of $29,546,640.00.

* * * * * *

Alfalfa Meal Mills—

Are "everywhere" in the valley, making a competitive as well as a ready market for alfalfa.

Each water officer should wear a star or some emblem of authority at all times while in the discharge of his duties. The above would greatly enhance the efficiency of the office.

The value of self-registering gages is becoming more of a necessity each year. I hope to see all our ditches or canals, carrying over 25 second feet, soon equipped with them. Their value can not be overestimated.

DUTY OF WATER

The duty of water in the Arkansas Valley in this Water Division has been variously estimated, and as the area irrigated has increased, the estimate given upon the duty of water has also increased. The decrees entered in this Water Division are uniformly and greatly excessive in amounts and under the ditches given these excessive decrees the acreage irrigated has been continuously increased and the use of water under the direct flow ditches, where the water is used merely because it is in the river, whether it is needed or not, has led to great waste. This excessive use of water has been indulged in by the users to such an extent that thousands of acres of land have been turned to seepage and become waste. An estimate of the amount of water actually diverted from the river for the use of irrigation of lands under the various ditches shows that there is a variation in the amount diverted in proportion to the lands irrigated, running from practically one acre-foot up to as high as ten acre-feet to the acre. The difficulty in the distribution of water is that it is based upon the flow of water in cubic feet per second instead of acre-feet dependent upon the necessities of the use. If water could be had at the crucial time in plant growth, it can be made to do double duty of water applied whether it is needed or not, and I have found that the greatest duty of water is therefore attained in connection with storage systems, where the application of water can be made at the crucial time and not dependent upon the fact as to whether water will be in the river available for use. While, as stated above, the use has varied from one acre-foot up to ten acre-feet to the acre, as I believe to the great detriment of the lands receiving these excessive amounts, I think from the experiments that have been conducted in the Experiment Stations of the several arid states, it must be concluded that two acre-feet measured at the headgate is sufficient for the proper irrigation of growing crops, if applied at the proper time, grown in the Arkansas Valley, and while I am aware of the fact that under the decrees ditches have certain vested rights, yet I firmly believe that the excessive use of water should be limited and I believe that a law should be placed upon the Statute which would limit the amount of water which any ditch would have the right to divert during an irrigation season to not to exceed two acre-feet to the acre. Such a law would be of advantage even to these ditches that have heretofore been making the excessive use of water upon the lands under the respective ditches, and I believe further that if a law could be passed providing for the conserving of water in the reservoirs, commencing on the upper head of the stream, the water that flows in the Arkansas River would be sufficient in quantity to at least double the amount of irrigable land now under the various systems. The manner of distribution through the Division Engineer's office in connection with the State Engineer's office under the decrees as now entered, is one of great difficulty and often leads to deprivation of the parties of their rights, and I further believe from the observation that I have had, if there could be created irrigation courts having the jurisdiction to administer the decrees now entered and making all water officials officers of such court and under its direction, that the interest of the consumer would be greatly conserved. I also believe that the question of measurements of water should be entirely under the supervision of the State Engineer's office, in connection with the various Division Engineers of the state, and I further believe that no adjudication should be had without the state being made a party to such proceedings and the decrees entered therein limited to the actual amounts of the use of water upon report from the State Engineer's office upon each particular ditch seeking to have its water rights adjudicated. While I appreciate these are matters of legislation, I feel it my privilege under the duties of my office to make the suggestions herein stated.

Associated in adjoining offices are Mr. M. N. Grant, Jr., a most competent hydrographer from the State Engineer's office, and the offices of the Arkansas Valley Ditch Association, working in unison. Thus we are better able to meet all the demands and requirements of the water consumers and direct the water officers better than ever before.

In conclusion I desire to thank the State Engineer and his deputies for their courteous treatment, and substantial advice on all matters concerning this office.

I wish to thank the several Water Commissioners in this Division for their active and faithful discharge of their duties and for accurate and reliable information.

Very sincerely,

E. R. CHEW,
Irrigation Division Engineer, Division No. 2.

IRRIGATION DIVISION NO. 2

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

(1) District No.	(2) No. of Ditches Reported	(3) Amount of Appropriation in Second Feet	(4) Capacity of Ditches Second Feet	(5) Length of Main Ditches in Miles	(6) Length of Laterals in Miles
10	......	644.4	......	128	......
11	......	765.5	......	650	......
12	......	671.3	......	......	......
13	......	533.2	......	216	......
14	......	217.0	......	......	......
15	......	195.4	......	112	......
16	......	103.6	......	......	......
17	......	3,541.2	......	......	......
18	......	270.0	......	......	......
19	......	581.0	......	248	......
49	......	......	......	......	......
66	......	......	......	......	......
67	......	926.0	......	204	......
Totals	......	8,448.6	......	......	......

IRRIGATION DIVISION NO. 2—Continued

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

District No.	(7) First Day Water Diverted from Natural Streams for Irrigation	(8) Last Day Water Diverted from Natural Streams for Irrigation	(9) Maximum No. of Days Water was Diverted from Natural Streams for Irrigation	(10) Average Daily Amount of Water Diverted During Season by Ditches from Natural Streams for Irrigation, Sec. Ft.
10	......	......	3,389	215
11	......	......	......	677
12	......	......	1,236	352
13	......	......	4,962	74
14	......	......	2,547	7,617
15	......	......	5,389	100
16	......	......	......	1,618
17	......	......	558	978
18	......	......	1,231	52
19	......	......	......	......
49	......	......	......	......
66	......	......	......	......
67	......	......	......	......
Totals	......	......	19,312	11,683

IRRIGATION DIVISION NO. 2—Continued

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

District No.	(11) No. of Acre Feet Diverted by Ditches During Season from Natural Streams for Irrigation	(12) Total No. of Acres That Can be Irrigated	(13) Alfalfa	(14) Natural Grasses	(15) Cereals
10	35,887	13,886	2,850	3,159	1,431
11	2,127	31,668	6,671	8,185	3,721
12	127,561	31,863	7,281	1,305	4,316
13	16,069	3,540	806	1,966	744
14	21,999	122,765	54,409	2,853	13,251
15	18,965	8,172	3,549	1,638	1,490
16	22,311	....	16,423	2,106	8,837
17	208,790	240,585	82,460	2,555	43,750
18	3,896	5,402	2,446	750	1,051
19	....	34,197	12,853	3,658	3,191
49	....	....	....	....	....
66	....	....	....	....	....
67	184,248	93,456	29,623	7,190	9,945
Totals......	642,853	585,474	219,369	35,345	91,713

NOTE.—No report from districts 49 and 66.

IRRIGATION DIVISION NO. 2—Continued

District No.	(16) Orchards	(17) Market Gardens	(18) Potatoes	(19) Sugar Beets	(20) Timothy	(21) Other Crops	(22) Total No. of Acres Irrigated
10	75	228	8	103	....	1,136	8,890
11	67	56	341	....	1,424	2,536	23,995
12	9,947	361	29	40	....	1,849	24,428
13	12	8	4	....	....	1,100	3,540
14	2,400	1,183	65	16,391	....	11,413	104,179
15	56	....	3	39	....	948	6,788
16	729	272	......	265	....	1,878	19,676
17	1,930	1,350	......	29,900	....	13,500	182,480
18	10	5	30	....	....	550	4,822
19	105	516	28	....	6,000	10,295	29,871
49	....	....	......	....	....	....	....
66	....	....	......	....	....	....	....
67	426	....	......	3,488	....	13,556	56,832
Totals..	15,757	3,979	508	50,266	7,424	58,761	464,391

IRRIGATION DIVISION NO. 2—Continued

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL RESERVOIR REPORTS FOR THE IRRIGATION SEASON OF 1917.

District No.	(1) No. of Reservoirs Reported	(2) Area of High Water Line (Acres)	(3) Capacity of Reservoir in Acre Feet	(4) Quantity of Water in Reservoirs May 1 in Acre Ft.	(5) Quantity of Water in Reservoirs Nov. 1 Acre Ft.	(6) No. of Acre Feet Used from Reservoirs During Season
10	16	....	16,893	16,893	1,775	Not reported
11	4	4,156	95,074	37,000	27,015	25,194
12	3	....	5,960	4,272	160	4,120
13	1	....	60	60	None	60
14	3	3,680	31,600	Incomplete	Incomplete	Incomplete
15	1	70	940	940	386	Incomplete
16	20	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete
17	13	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete
18	....	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete
19	....	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete
67	....	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete

ANNUAL REPORT DIVISION ENGINEER

DIVISION NO. 2—1918

Pueblo, Colo., December 4, 1918.

Hon. A. J. McCune,
State Engineer,
Denver, Colorado.

Dear Sir: I have the pleasure of handing you my report for the fiscal year ending November 30, 1918.

In former reports I have described this water division and the use of water very minutely, therefore deem it unnecessary to do so again. It has been our pleasure to note the steady increase in irrigated lands developed under the numerous systems of irrigation. We have over six hundred thousand acres under an excess of thirty-five hundred miles of irrigating ditches or canals. This development is due primarily to individual and community enterprise, later to the large companies (mutual). Nearly all of these enterprises have reached a most satisfactory basis, in that almost the entire acreage is under cultivation.

It may be of interest here to state some of the record crops produced in this valley, for instance: Bent County, 83 bushels of wheat to the acre on 23 acres. Otero County, 130 bushels of oats to the acre on 40 acres. Pueblo County, 110 bushels corn an acre on 40 acres. El Paso County, 3,500 pounds beans per acre on 3 acres, and several have produced over 30 tons of sugar beets to the acre.

The proper preparation of the ground, correct application of the water, thorough cultivation is responsible for this, and in fact for all good crops of whatever kind.

* * * * *

RAINS AND MOISTURE

As the following report of the Government Observer will show we had very little rain, far under the normal, in fact this was an extremely dry, hot year. The rainfall in December was .10″; in January, .61″; in February, .79″; June, 1.02″; July, .93″; August, .57″; September, 1.43″; October, .14″; November, .63″; a total of 7.94 inches. The winter was dry and cold, very little snow, and that mostly blowing away, so that no moisture resulted therefrom. There were no floods in the river or its tributaries with one exception, and that the Clear Creek cloudburst, which filled the Clear

Creek Reservoir so that its spillway began to give way, and but for the timely action of the State Engineer, and the D. & R. G. Railway Company, the damage to the reservoir would have been very serious to the railway tracks and the people below to a most alarming extent. The outlet to this reservoir is so small, so absolutely inadequate as to be a menace, and a serious disturber in the distribution of the waters of the Arkansas river, in that it "unavoidably" fills at times when there is no water for it, and is needed by those entitled to it; this very year it caused serious and endless trouble, bickering, and contests for this water. As there has never been a satisfactory way devised to handle this difficulty, I would advise the State Engineer to condemn it, and the state acquire it, order the waters that may be in it distributed as is done from other state reservoirs.

There developed several serious and ugly contentions for water. Naturally following this were accusations against the water officers. What caused this? Primarily the shortage of water in the streams, and from the cause above stated. The water commissioners complained bitterly that claims, absolutely without merit, and unjust, were pushed with such determination as to drive them to the verge of desperation. That it was not in human power to comply with their demands.

The Purgatoire and Holbrook cases were prominently unique in their demands. These particular cases, demands, or controversies, or however you choose to designate them, were taken to the Division Engineer, then appealed to the State Engineer, in both instances were settled with fairness and justice to all concerned, then dismissed. Whether or not this was entirely satisfactory to both parties we have not inquired, but we do know it was a just and equitable settlement after a most exhaustive hearing.

I wish to state here that most, if not all, these controversies could be averted if there existed that confidence and fairness between management or users of water and the water officials that should exist. The help and advice of the ditch management is as much needed by the water officer as are his services by them. This would spell good business for all.

DIVISION ENGINEER'S OFFICE

If this office is to serve well the purposes for which it was created, and the records of same to be of value, the S. O. S. needs to be sent out strong and swiftly. First the expense fund is absolutely inadequate, the various ditches are called upon to pay, or I had better say certain ditches are called on to pay, telephone charges that all are more or less interested in; the Ditch Association comes forward with assistance, and in other ways assistance is given, but for this the office could not exist in anything like an approach to efficiency. Five hundred dollars is totally inadequate for this office. There should be not less than $1,000. There is no furniture in the office for storing or keeping most valuable records and papers, the filing cabinets are bundles on the floor. Each year the Division Engineer contributes from his salary the expense account of October and November. No funds. The state did make a feint at furnishing our office and passed a bill setting aside an amount to do so, but for some reason unknown, was put in the -steenth class where there never was a dollar, and there the good intentions rest.

SUGGESTIONS

I would first suggest that the above be remedied for the good of the valley and state.

I strongly advise a complete revision of all the irrigation laws on our statutes. Further that the State Engineer's office and the Division Engineers be called upon to give or make such suggestions as seem to them needful, based upon their experience.

We had associated with us a most competent and satisfactory hydrographer in Mr. M. N. Grant, from the office of the State Engineer. He was devoted to his work, accurate and efficient, gaining the confidence of all who came in contact with him. With the assistance given this office we were enabled to meet the trying exigencies of a dry summer, and a shortage of water, with the trouble incident thereto, better than ever before. Automatic gages were established in the reservoirs and several of the larger canals. Whilst at this work Mr. Grant was stricken with the "flu" on the twenty-fourth of October and died within a few days. In him the state lost a most faithful and efficient officer. I wish to thank the State Engineer and his accomplished force for their uniformly kind treatment, and valuable advice and assistance freely given in all matters pertaining to the welfare of this office. I assure you of its appreciation.

I cannot pass without thanking the Water Commissioners for their faithful and energetic services. I feel that every one performed his duties to the best of his ability, and in several cases it was extremely trying and exasperating, yet their conduct under such circumstances was all that could be asked.

Again acknowledging the courtesies, and pleasant relations existing between us, I am

Respectfully yours,

E. R. CHEW,
Irrigation Division Engineer,
Division No. 2.

IRRIGATION DIVISION NO. 2

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

(1) District No.	(2) No. of Ditches Reported	(3) Amount of Appropriation in Sec. Ft.	(4) Capacity of Ditches Sec. Ft.	(5) Length of Main Ditches in Miles	(6) Length of Laterals in Miles
10	......	644.34	......	127.3	......
11	......	701.93	885.8	300.6	91.2
12	......	591.14	......	245.5	......
13	......	478.32	......	245.5	......
14	......	2170.00	2128.5	238.9	......
15	......	200.15	271.9	95.0	......
16	......	521.64	......	......	......
17	......	......	......	......	......
18	......	......	......	......	......
19	......	583.43	......	265.5	......
49	......	......	......	......	......
66	......	......	......	......	......
67	......	......	......	......	......
Totals......	......	5790.95	3286.2	1518.3	91.2

IRRIGATION DIVISION NO. 2—Continued

District No.	(7) First Day Water Diverted from Natural Streams for Irrigation	(8) Last Day Water Diverted from Natural Streams for Irrigation	(9) Maximum No. of Days Water Was Diverted from Natural Streams for Irrigation	(10) Average Daily Amount of Water Diverted During Season by Ditches from Natural Streams for Irrigation Sec. Ft.
10	Mch. 1	Dec. 1	4,357	256.2
11	May 1	Oct. 15	153	512.7
12	Mch. 1	Dec. 1	10,400	362.1
13	May 1	Oct. 15	27,807	299.5
14	Dec. 1, 1917	Dec. 1	3,941	596.1
15	Mch. 1	Nov. 1	5,014	93.1
16	Mch. 1	Nov. 1	......	496.9
17	Dec. 1, 1917	Dec. 1	1,780	977.0
18	Mch. 1	Nov. 1	......	56.2
19	Mch. 1	Dec. 1	......	......
49	......	......	......	......
66	......	......	......	......
67	......	......	......	......
Totals			53,452	3,649.8

IRRIGATION DIVISION NO. 2—Continued

District No.	(11) No. of Acre Feet Diverted by Ditches During Season from Natural Streams for Irrigation	(12) Total No. of Acres That Can Be Irrigated	(13) Alfalfa	(14) Natural Grasses	(15) Cereals
10	50,333	21,848	5,415	3,711	2,558
11	163,130	32,377	6,650	6,722	6,343
12	130,116	29,691	7,076	846	4,004
13	68,152	19,408	1,757	13,633	3,956
14	242,290	119,950	60,484	4,717	10,995
15	18,064	9,767	4,697	1,331	2,398
16	19,776	....	14,150	1,619	9,537
17	279,220	156,240	60,090	2,520	41,200
18	5,364	5,014	2,578	698	773
19	....	43,871	16,564	5,013	5,018
49	....	....	....	....	....
66	....	....	....	....	....
67	....	....	....	....	....
Totals	976,427	438,166	179,461	40,810	86,782

NOTE.—Acreage given includes all irrigated area from both ditch and reservoir.

IRRIGATION DIVISION NO. 2—Continued

District No.	(16) Orchards	(17) Market Gardens	(18) Potatoes	(19) Sugar Beets	(20) Timothy	(21) Other Crops	(22) Total No. of Acres Irrigated
10	152	547	4	72	....	3,173	18,187
11	85	68	584	5	1,601	2,468	24,634
12	9,552	559	49	60	....	991	23,237
13	12	11	9	30	....	....	19,408
					Beans		
14	2,305	1,395	70	11,485	4,540	11,824	106.813
15	68	1	5	66	84	69	8,963
16	623	16	265	207	....	1,203	30,632
17	582	399	45	9,755	500	9,870	123,280
18	....	....	44	....	208	455	4,436
19	127	423	179	50	7,056	4,099	38,529
49	....	....	....	....	....	....	....
66	....	....	....	....	....	....	....
67	....	....	....	....	....	....	....
Totals	13,506	3,419	1,254	21,730	13,989	34,152	398,119

IRRIGATION DIVISION NO. 2—Continued

District No.	(23) Superintendence	(24) Repairs	(25) Improvements
10		$ 6,660.00	
11	$ 200.00	10,597.00	
12	13,593.00	8,916.00	
13		553.00	
14	18,770.00	53,344.00	$20,825.00
15		3,183.00	
16	19,707.00		1,700.00
17	23,016.00		
18			
19	7,050.00	8,441.00	
49			
66			
67			
Totals	$82,336.00	$91,694.00	$22,525.00

IRRIGATION DIVISION NO. 2

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL RESERVOIR REPORTS FOR THE IRRIGATION SEASON 1918.

District No.	(1) No. of Reservoirs Reported	(2) Area of High Water Line Acres	(3) Capacity of Reservoir in Acre Feet	(4) Quantity of Water in Reservoirs May 1st in Acre Ft.	(5) Quantity of Water in Reservoirs Nov. 1st in Acre Ft.	(6) No. of Acre Ft. Used from Reservoirs During Season
10	16		17,000	16,928	8,708	Not reported
11	3	3,288	88,137	38,860	18,800	38,835
12	1		2,800	1,170	69	1,184
13	1	2	59	59	None	59
14	None					
15	1					1,260
16	1	1,590	42,946	1,160	473	3,230
17	4	8,708	102,478	Incomplete report	Incomplete report	50,325
19	1	1,600	20,000	4,500	3,500	10,000
Totals	28	15,188	273,420	62,677	31,550	104,893

ANNUAL REPORT IRRIGATION DIVISION ENGINEER

NO. 3—1917

November 23, 1917.

Addison J. McCune,
State Engineer,
Denver, Colorado.

Dear Sir: I hand you herewith my annual report for the fiscal year ending November 30, 1917, on ditches and reservoirs in Irrigation Division No. 3, comprising the eight districts in the San Luis Valley and covering the drainage basin of the Rio Grande Del Norte River and its tributaries in the State of Colorado.

We have had an exceptionally good run of water from the streams this year which has remained steady throughout the heavy irrigation season notwithstanding the fact that the rains were late and only local. In some districts the rains were too late to be of benefit to crops. The streams did not start to rise until May, which fact insured sufficient water for all crops and very few ditches demanded water prior to May 15th.

The reservoirs were all filled early in the spring and very little water was needed from them, except where water was used in ditches not having direct rights from the streams, so that a good storage supply will be carried over until 1918.

Late snows in April throughout the districts put the ground in excellent shape for the crops and that condition was maintained through the irrigating and growing season, with the result that the valley continues in its prosperous state and its increase in acreage cultivation and production.

The price for potatoes last year materially increased the acreage of that crop this season regardless of the high cost of the seed and the production was more than gratifying to the farmers.

The development of the drainage districts and formation of new ones continues and two more new districts have been added. Work on these districts will commence as soon as the bonds can be sold. The drainage of lands has progressed slowly during the past summer due to the scarcity of labor, which has been prevalent throughout the country, but the work has continued and will be continued to completion as rapidly as possible. The districts already completed are showing an increase in acreage production each year and also showing that when ten to fifteen dollars per acre is expended in draining that amount is soon returned to the owners of the land.

The owners of ditches are continuing the good work on substantial headgates and measuring flumes and this office is doing all it can to keep them rated and supply cards to the Water Commissioners and owners. Notices of the laws concerning headgates and measuring flumes are being served by the Water Commissioners as fast as found practical and we hope to see each district in first-class shape and a card on each ditch.

The Water Commissioners have handled their districts in good shape during the past season and served the water users faithfully. The water supply of the streams being exceptionally good through the season as we had very few controversies and these were settled satisfactorily to all parties concerned.

In accordance with the plans of the Governor's War Council, this office issued instructions to all reservoir owners and owners of the larger ditches to take the necessary steps to guard and protect their dams and headworks from any damage that might be done by German sympathizers and permit no trespassing. These instructions were carried out in each instance and no case of damage has been reported. The Water Commissioners were notified to watch the ditches closely and prevent waste, in order that more water could be supplied to ditches of very late priority. They also made arrangements with owners of the early priorities to supply the late decrees in case the water might be short and this was necessary only in a few cases.

The farmers and stockmen of the division were behind the national movement of increased crops and put under cultivation every available acre of ground as well as increasing and caring for their herds of cattle, sheep and hogs, but have experienced great difficulty in procuring labor at a much higher wage than ever paid.

For the most part the division has been free from trouble. However, in District No. 21, during December of last year one of the valves in the Terrace Dam gave way letting out about eight thousand acre-feet of water at the rate of six hundred second feet. This water flooded a large area of pasture lands, but caused no loss of livestock. As soon as the valve was replaced, storage began and on June 7th the water was going over the spillway, although on April 1st the water, in storage, was three thousand acre-feet short of the amount the previous year. Later a leak of three second feet occurred in the dam and the water was drawn from the reservoir as rapidly as possible to a point below the leak, preventing any damage, although at first there was fear that the dam would go out. The district immediately made arrangements to repair the dam and this work is being pushed in good shape to prevent any further recurrence.

In conclusion I desire to thank the State Engineer for his advice on all matters relative to this Division and the Water Commissioners who have worked hard in the performance of their duties.

Respectfully submitted,

D. A. NORTON,

Irrigation Division Engineer, Division No. 3.

IRRIGATION DIVISION NO. 3

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917

(1) District No.	(2) No. of Priorities Reported	(3) Amount of Appropriation in Second Ft. Reported	(4) Length of Main Ditches in Miles	(5) Length of Laterals in Miles
20	406	5,607	418	878
21	59	1,386	199	....
22	188	5,716	258	....
24	63	310	83	18
25	200	952	....	70
26	208	539	115	15
27	60	107	39	8
35	60	539	118	117
Totals	1,244	15,156	1,230	1,106

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

District No.	(6) First Day Water Diverted from Natural Streams for Irrigation	(7) Last Day Water Diverted from Natural Streams for Irrigation	(8) Maximum No. of Days Water Diverted from Natural Streams for Irrigation	(9) Maximum No. of Days Water Carried from Reservoirs
20	Mar. 15	Nov. 1	230	45
21	Apr. 11	Oct. 22	194	153
22	May 12	Nov. 1	172	85
24	Mar. 30	Nov. 1	215	200
25	Apr. 15	Nov. 1	199	......
26	Apr. 1	Nov. 15	229	......
27	Mar. 15	Nov. 1	230	......
35	Apr. 1	Nov. 1	214	196
Totals			1,683	679

IRRIGATION DIVISION NO. 3

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

District No.	(10) Amount of Water Carried from Reservoirs in Acre-Ft.	(11) Average Daily Amount of Water Diverted by Ditches During Season from Natural Streams for Irrigation Second Feet	(12) No. of Acre-Feet Diverted by Ditches During Season from Natural Streams for Irrigation	(13) Total No. of Acres that can be Irrigated
20	16,570	1,812	694,343	321,315
21	15,895	642	99,538	64,795
22	No. report	1,221	265,330	117,600
24	93,990	134	25,681	19,096
25	....	380	59,318	67,990
26	....	369	83,546	40,302
27	....	67	13,559	5,713
35	12,554	213	43,520	63,645
Totals	139,009	4,838	1,284,835	700,456

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

CROPS IRRIGATED FROM CANALS IN ACRES

District No.	(14) Alfalfa	(15) Natural Grasses	(16) Cereals	(17) Orchards	(18) Market Gardens
20	33,718	98,309	71,528	40	982
21	4,770	23,939	8,099	....	....
22	6,880	30,490	20,630	10	385
24	4,717	2,025	8,437	15	6
25	920	13,120	1,455	2	....
26	2,823	29,263	1,432	4	2
27	464	2,897	166	....	3
35	1,206	7,150	2,737	2	8
Totals	55,498	207,393	114,484	73	1,386

IRRIGATION DIVISION NO. 3

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

CROPS IRRIGATED FROM CANALS IN ACRES—Continued

District No.	(19) Potatoes	(20) Peas	(21) Other Crops	(22) Total Irrigated
20	13,113	58,095	41,090	316,875
21	286	5,929	1,189	44,212
22	3,975	25,550	9,635	97,555
24	78	13,372	1,278	29,908
25	134	....	360	15,991
26	63	....	4,178	37,765
27	60	601	17	4,208
35	64	1,287	2,366	14,820
Totals..	17,773	104,834	60,113	561,334

In Districts Nos. 25 and 26 Peas are included in report on Other Crops.

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

COST IN DOLLARS

District No.	(23) Superintendence	(24) Repairs	(25) Improvements
20	$37,442.38	$18,457.20	$12,488.98
21	175.00	215.00	415.00
22	No report	No report	No report
24	1,542.00	340.00	310.00
25	No report	No report	No report
26	600.00	2,766.45	360.00
27	No report	293.00	250.00
35	2,000.00	9,210.00	350.00
Totals......	$41,759.38	$31,281.65	$14,173.98

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL RESERVOIR REPORTS FOR THE IRRIGATION SEASON OF 1917.

District No.	(1) No. of Reservoirs Reported	(2) Area of High Water Line (Acres)	(3) Capacity of Reservoir in Acre Feet	(4) Quantity of Water in Reservoirs May 1 (Acre Ft.)	(5) Quantity of Water in Reservoirs Nov. 1 (Acre Ft.)	(6) No. Acre Ft. of Reservoir Water Carried During Season
20	5	....	....	26,245	30,342	16,570
21	2	1,651	31,752	10,219	3,723	15,787
22	1	....	4,280	....	....	....
24	5	4,120	112,390	12,220	2,476	93,990
35	2	1,348	15,488	15,189	8,511	12,554

ANNUAL REPORT IRRIGATION DIVISION ENGINEER
NO. 3—1918

Alamosa, Colo., Nov. 30, 1918.

Hon. Addison J. McCune,
State Engineer,
Denver, Colorado.

Dear Sir: I have the pleasure of handing you herewith my annual report of ditches and reservoirs for the fiscal year ending November 30, 1918, for Irrigation Division No. 3, comprising the eight districts in the San Luis Valley, and covering the drainage basin of the Rio Grande del Norte and its tributaries.

Owing to the light fall of snow in the mountains last winter, the supply of water during the season just closed has been very short.

A better and more economical use of water was had this season through the organization of water users' associations in the different districts by Hon. John E. Field, who, as one of the members of a committee on conservation of water, appointed by the "War Board," made a canvass of the division, held meetings, and advised with the water users. Committees were appointed in each district, whose duties were to study the situation in their neighborhoods and to report to and advise with the Water Commissioner. A great deal of good was accomplished by the work of these committees—owners of old water priorities were prevailed upon to loan water to their less fortunate neighbors and a beneficial use was made of the water both day and night.

I wish to mention the valuable assistance rendered this office by Mr. H. D. Amsley, hydrographer from the State Engineer's office.

In conclusion, I desire to thank the State Engineer for his advice and assistance in matters that have come up in this division.

Respectfully submitted,

(Signed) E. S. COUNSELOR,
Irrigation Division Engineer, Division No. 3.

IRRIGATION DIVISION NO. 3

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

(1) District No.	(2) No. of Priorities Reported	(3) Amount of Appropriation in Second Feet Reported	(4) Length of Main Ditches in Miles	(5) Length of Laterals in Miles
20	345	5,541	767	465.00
21	83	1,432	211	No report
22	187	5,738	190	No report
24	68	312	84	18.50
25	129	396	No report	No report
26	177	551	363	No report
27	26	28	13	No report
35	46	507	132	79.12
Totals	1,061	14,505	1,760	562.62

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

District No.	(6) First Day Water Diverted from Natural Streams for Irrigation	(7) Last Day Water Diverted from Natural Streams for Irrigation	(8) Maximum No. of Days Water Diverted from Natural Streams for Irrigation	(9) Maximum No. of Days Water Carried from Reservoirs
20	Apr. 1	Nov. 1	210	No report
21	Apr. 1	Sept. 1	142	20
22	May 1	Nov. 10	194	No report
24	Mar. 11	Nov. 15	249	174
25	Apr. 15	Nov. 30	100	No report
26	Apr. 1	Nov. 10	217	No report
27	Apr. 1	Nov. 15	214	No report
35		Nov. 1	214	No report
Totals			249	174

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

District No.	(10) Amount of Water Carried from Reservoirs in Acre Ft.	(11) Average Daily Amount of Water Diverted by Ditches During Season from Natural Streams for Irrigation Second Feet	(12) No. of Acre Feet Diverted by Ditches During Season from Natural Streams for Irrigation	(13) Total No. of Acres that can be Irrigated
20	35,400	1,542	303,435	306,326
21	1,320	458	....	59,047
22	No report	846	190,996	85,380
24	84,368	119	28,484	13,536
25	....	126	8,950	35,100
26	....	211	42,224	37,223
27	....	18.5	6,604	2,908
35	11,093	186	37,215	56,215
Totals	132,181	3,506.5	618,480	595,735

IRRIGATION DIVISION NO. 3

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

CROPS IRRIGATED FROM CANALS IN ACRES

District No.	(14) Alfalfa	(15) Natural Grasses	(16) Cereals	(17) Orchards
20	29,534	71,143	47,314	36
21	4,339	20,071	5,945	......
22	7,540	29,365	17,610	40
24	1,281	2,158	3,922	27
25	1,000	19,140	1,510	2
26	1,996	19,352	1,474	......
27	281	1,378	145	......
35	1,256	3,519	3,652	3
Totals	47,227	166,126	81,572	108

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

CROPS IRRIGATED FROM CANALS IN ACRES

District No.	(18) Market Gardens	(19) Potatoes	(20) Peas	(21) Other Crops	(22) Total Irrigated
20	819	15,776	53,735	7,089	225,446
21	....	555	7,906	1,324	40,140
22	296	7,455	23,885	10,849	97,040
24	....	78	2,646	404	10,516
25	....	149	....	350	22,151
26	1	41	....	3,710	26,575
27	....	30	312	....	2,146
35	1	192	2,312	841	11,776
Totals	1,117	24,276	90,796	24,567	435,790

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

COST IN DOLLARS

District No.	(23) Superintendence	(24) Repairs	(25) Improvements
20	$29,486.26	$11,549.26	$ 3,000.00
21	No report	No report	No report
22	No report	No report	No report
24	997.00	93.00	75.00
25	1,500.00	No report	No report
26	No report	No report	No report
27	No report	No report	No report
35	5,325.00	4,130.00	2,000.00
Totals	$37,308.26	$18,357.23	$5,075.00

ANNUAL REPORT DIVISION ENGINEER
DIVISION NO. 4—1917

Montrose, Colorado, March 9, 1918.

Mr. A. J. McCune,
State Engineer,
Denver, Colo.

Dear Sir: In compliance with the Session Laws of 1903, I herewith hand you my annual report of Irrigation Division No. 4 for the fiscal year ending with this date. This division comprises an empire of a part or all of fourteen counties in the southwestern part of Colorado.

Generally speaking, the season was a profitable one for the farmers, although a heavy frost in the early part of October destroyed a large apple crop. The season was an extremely dry one, the rainfall being much lighter than usual. In the early part of the harvest season the prices that the farmers received for their crops were very good, but owing to the lack of transportation facilities and the shortage of cars, the farmers in this locality were unable to move their crops and as a result of the car shortage they met with a considerable loss in potatoes, onions, etc.

There were very few disputes over water and only one important case of litigation, viz., the Surface Creek Ditch and Reservoir Co. vs. the Lake Fork Ditch Co. The controversy was settled in favor of the last named company.

In District No. 40 a large number of rating flumes were installed. The method of measuring water in this district previous to last year was by the old Weir system. Five new rating stations were established, as follows, in this division during the season:

> On Leroux Creek and Surface Creek in District 40, self-recording gages were installed; in District No. 42, Kannah Creek, a cable station was established. On the Tomichi Creek in District No. 28, a self-recording gage was installed, and on the La Plata River in District No. 33 a rating station was established.

In the month of July I made a visit of inspection of the reservoirs that are located on Grand Mesa and as a result of that visit notices were served on many of the reservoirs to make necessary improvements, also the reservoir owners were notified to comply with Section 6, of the Session Laws of 1911, page 466, relative to the placing of gage rods in the reservoirs. We also met a large number of the water users of District No. 42 at a public meeting called for the purpose of discussing irrigation questions.

The greatest handicap in the distribution of water in this division is the method of appointing and paying the Water Commissioners. The method of appointing the Water Commissioners is a very unsatisfactory one and should be changed by statute at the earliest opportunity. * * * It seems useless to continue recommending a change in the manner of appointing and paying Water Commissioners, but I want to insist most urgently that nothing would improve the water distribution in this division as much as a change in the statutes, so that Water Commissioners could be removed from politics, and that competent men could be kept on the job and paid salaries by the state in proportion to their services.

The Uncompahgre Valley project, and the Grand Valley project, of the U. S. Reclamation Service, did considerable work during the season, and below is a report of the work accomplished on these two projects.

UNCOMPAHGRE VALLEY PROJECT—COLORADO

United States Reclamation Service

Fred D. Pyle, Project Manager

November 1, 1917

GENERAL PROGRESS

During the past year the following work was accomplished: A crusher plant was built at the river portal end of the Gunnison Tunnel; 6,615 linear feet of tunnel floor was plastered; eight concrete approaches were built at the ends of existing concrete sections in the rock section of the tunnel; 248 linear feet of concrete sidewalls and 146 linear feet of arch were also built in the tunnel; the old timber diversion into the Uncompahgre River at the end of the South Canal was replaced with a concrete structure; the West Canal Extension Siphon Lateral (the principal feature of which consists of a 12-inch wooden stave pipe siphon 2,100 feet long) was built to irrigate the upper end of Franklin Mesa; a high line extension lateral to the Chipeta Ditch was built; the Buttermilk Lateral was excavated under contracts; good progress was made on the enlargement of the California Mesa Lateral System; drainage investigations were continued; the irrigable area surveys were completed and four new section houses were built. All construction work will be practically completed during the coming winter season.

RESULTS

The following is a brief summary of results accomplished from July 1, 1916, to June 30, 1917:

Miles of canal constructed	13	
Structures costing from $500 to $2,000 ea	5	
Structures costing from $100 to $500 ea	98	
Structures costing less than $100 ea	297	
Number of bridges built	33	
Number of culverts built	23	
Number of wooden pipe siphons built	1	— length 2,100 ft.
Number of flumes built	10	
Excavation—Class 1 material	83,308	cu. yds.
Excavation—Class 2 material	1,189	cu. yds.
Excavation—Class 3 material	395	cu. yds.
Concrete placed	2,105	

The construction work accomplished to date has made it possible to deliver water during the past irrigation season to a total of 80,000 acres, of which amount 58,000 acres were in crop.

* * * * *

OPERATION

The spring season was very late, the last frost occurring on May 9. This frost, however, did no damage to crops. The snowfall on the watershed was somewhat less than normal. The runoff, however, was good until midsummer, due to the cool weather that prevailed during the spring. The precipitation during May was about 100 per cent above normal. As a result several floods occurred in the river and canal system, which necessitated considerable protection work at headgate diversions. Project water was delivered on a rental basis at $80.00 per second foot continuous flow for the season. This is a wasteful method of water delivery and some change to an acre-foot or rotation system will be required at the time the project is fully developed. The rainfall and mean temperatures at Montrose, Colorado, were as follows:

	Season of 1916-1917		7-Year Average	
	Precipitation Inches	Mean Temperature	Precipitation Inches	Mean Temperature
1916				
November	.82	33	.51	37
December	.62	24	.84	24
1917				
January	.62	18	.86	24
February	.07	29	.19	31
March	.69	32	.71	39
April	1.09	45	1.03	48
May	2.18	50	1.11	56
June	.16	65	.67	65
July	.49	74	1.07	71
August	1.53	68	1.25	69
September	.70	61	1.08	59
October	.13	48	1.24	48
Total	9.10		10.56	

No particular trouble was encountered in operating the project except for the sliding banks on the Montrose and Delta and Ironstone Canals, and the settling and breaking up of short portions of the concrete lining in the South Canal. The flow of the Uncompahgre River dropped from 400 c. f. s. at the beginning of August to 100 c. f. s. at the end of August; during September the flow remained nearly constant at 100 c. f. s. and during October began another drop until the minimum of 50 c. f. s. was maintained. The minimum flow of the Gunnison River ranged from 500 to 550 c. f. s. during the latter part of September and fore part of October. During the period of heavy irrigation in the valley, the flow of the Gunnison River was always in excess of 1,000 c. f. s. The maximum discharge of the Gunnison Tunnel was 901 c. f. s. The water supply was ample during the entire irrigation season. It is estimated that about 5.5 acre-feet of water was delivered to the water users for each acre of land in crop.

* * * * *

GENERAL CONDITIONS

The financial condition of project farmers improved during the past year on account of good yields and good prices and the large increase in the livestock industry. Farmers, however, did not net as much profit during the 1917 season as they did during the previous season due to the high prices of labor and farming materials. Several carloads of graded stock have been brought in and arrangements are being made to purchase several more cars. There are 61 silos on the project, 27 of which were built during the past season.

GRAND VALLEY PROJECT—COLORADO

U. S. Reclamation Service

S. O. Harper, Project Manager

November, 1917

Construction. A small force was employed at the Grand River diversion dam in dismantling the construction plant, disposing of surplus equipment and cleaning up the grounds. During the extreme high water approximately 120 cubic yards of loose rock riprap were placed to protect the river bank below the dam. The greatest flood on record with a discharge of 50,000 cubic feet per second occurred on June 20, 1917. No damage resulted to any of the project structures, but some private irrigation systems and bridges suffered.

The project main canal was completed from the headworks to West Salt Creek, a distance of 55 miles. The pile trestle which supported the 60-inch wood siphon pipe across East Salt Creek was replaced by a 96-foot span steel truss bridge in concrete piers. Floods during the previous year indicated the necessity of this change. An automatic siphon spillway containing two hand-operated wastegates combined with a check structure was built near Mack Wash. A reinforced concrete culvert carrying the canal under the track of the Uintah Railway was finished and two timber drops were installed at the present terminus of the canal to safely waste surplus water into West Salt Creek.

All laterals from Indian Waste to the Big Salt Wash, comprising the First Lateral District, were completed prior to January 1, 1917, and those between Big Salt Wash and West Salt Creek were under construction on that date. Facilities are now completed to serve practically all land in the gravity area of the project east of West Salt Creek except that portion near Loma and Mack, Colorado, which is at an elevation requiring a siphon approximately 17,000 feet in length. It is not proposed to place this pipe until sufficient land will be put in cultivation to justify this expenditure. Water was available, however, for approximately 35,000 acres during the present season.

Preliminary studies have been made of methods and location of facilities to supply the pumping areas of the project, and surveys to determine the irrigable areas of the project are being carried on at the end of the year.

RESULTS

The following is a brief summary of work performed during period July 1, 1916, to June 30, 1917, and the total to the latter date:

ITEM	July 1, 1916, to June 30, 1917	Total to June 30, 1917
Miles of canal constructed	49.9	232.3
Structures costing over $2,000	3	31
Structures costing $500 to $2.000	9	109
Structures costing $100 to $500	29	186
Structures costing less than $100	526	2,366
Number of bridges built	21	149
Number of culverts built	34	170
Length of pipe laid, lin. ft.	5,557	32,668
Number of flumes built	9	69
Excavation—		
Class 1—cubic yards	215,339	3,023,026
Class 2—cubic yards	18,254	484,896
Class 3—cubic yards	1,780	186,001
Total excavation	235,373	3,693,923
Riprap placed—cubic yards	1,430	7,264
Paving placed—square yards	....	18,392
Concrete placed—cubic yards	880	55,077

* * * * *

OPERATION AND MAINTENANCE

Water was regularly distributed for the first time on this project during the season of 1916 and then only on lands in the First Lateral District. During 1917 the canal system was operated through the entire length of 55 miles and such laterals as were required for water deliveries were in regular operation. Practically all laterals were seasoned ready for operation.

Water was delivered on demand on a rental basis at the rate of 40 cents per acre-foot. In an effort to stimulate food production during the period of the war a reduction to 10 cents per acre-foot was allowed for all lands which were not plowed or for which water application had not been made prior to April 11, 1917.

Approximately 4,500 acres were cultivated during the season and a considerable additional area was planted in fall wheat.

The cold spring and hot dry summer was not especially conducive to good crop returns, but crops were generally satisfactory. An excellent crop of alfalfa hay was harvested. Grain and sugar beets gave good returns.

No serious interruptions of water service occurred. A few small breaks in laterals were repaired with little delay. On December 31, 1917, the project will be about 70 per cent completed.

Attached hereto is the regular statutory tabulation of the annual reports of Water Commissioners.

Very respectfully,
(Signed) H. C. GETTY,
Irrigation Division Engineer,
Division No. 4.

IRRIGATION DIVISION NO. 4

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

(1) District No.	(2) No. of Ditches Reported	(3) Amount of Appropriation in Second Feet	(4) Capacity of Ditches in Second Ft.	(5) Length of Main Ditches in Miles
28	179	376.00	....	....
34	89	195.75	....	....
40	142	702.00	1,264.0	404
41	52	885.00	2,074.0	270
42	53	319.70	588.0	272
61	27	27.16	205.0	....
68	112	440.00	809.0	231
Totals	654	2,945.61	4,940.0	1,177

NOTE.—No report from Districts 30, 33, 60, or 62.
No Water Commissioner in Districts 29, 31, 32, 63, or 69.
Acreage given includes all area irrigated by both ditch and reservoir.

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

District No.	(6) Length of Laterals in Miles	(7) First day Water Diverted from Natural Streams for Irrigation	(8) Last Day Water Diverted from Natural Streams for Irrigation
28	......	Apr. 1	Aug. 10
34	94	May 1	Oct. 1
40	......	Apr. 1	Oct. 10
41	267	Apr. 1	Nov. 12
42	203	Apr. 1	Oct. 29
61	......	Apr. 1	Nov. 1
68	......	Apr. 1	Nov. 15
Totals	564		

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

District No.	(9) Maximum No. Days Water was Diverted from Natural Streams for Irrigation	(10) Average Daily Amount of Water Diverted During Season by Ditches from Natural Streams for Irrigation Second Feet	(11) No. of Acre Feet Diverted by Ditches During Season from Natural Streams for Irrigation
28	122	430	70,760
34	130	146	....
40	193	766	184,997
41	217	940	299,878
42	198	424	61,975
61	245	53	14,736
68	195	....	....
Totals	1,300	2,759	632,346

IRRIGATION DIVISION NO. 4

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

District No.	(12) Total No. of Acres That Can be Irrigated	(13) Alfalfa	(14) Natural Grasses	(15) Cereals	(16) Orchards
28	20,993	64	19,280	169	....
34	....	2,907	778	2,482	80
40	72,147	17,263	6,487	10,718	7,285
41	93,950	19,541	1,503	16,282	3,693
42	22,896	12,131	2,570	2,606	443
61	12,403	2,822	....	....	72
68	30,266	4,158	2,498	2,842	77
Totals..	252,655	68,886	33,126	35,099	11,650

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1917.

District No.	(17) Market Gardens	(18) Potatoes	(19) Sugar Beets	(20) Timothy	(21) Other Crops	(22) Total No. of Acres Irrigated
28	....	36	....	......	....	19,477
34	65	211	....	824	....	7,349
40	280	2,185	1,855	......	2,178	48,257
41	2,328	6,185	2,000	......	2,050	53,582
42	19	419	96	......	108	18,392
61	1	28	....	......	957	4,737
68	77	384	43	......	....	17,311
Totals....	2,770	9,448	3,994	824	5,293	169,105

NOTE.—No report from Districts 30, 33, 60, 62.
No Water Commissioners in Districts 29, 31, 32, 63, 69.
Acreage given includes all area irrigated by both ditches and reservoirs.

IRRIGATION DIVISION NO. 4

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL RESERVOIR REPORTS FOR THE IRRIGATION SEASON OF 1917.

District No.	(1) No. of Reservoirs Reported	(2) Area of High Water Line (Acres)	(3) Capacity of Reservoir in Acre Feet	(4) Quantity of Water in Reservoirs May 1, in Acre Feet
34	2	125	3,369	2,984
40	97	3,318	37,229	None
42	32	....	12,600	5,007
61	1	....	....	....
Totals....	132	....	....	....

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL RESERVOIR REPORTS FOR THE IRRIGATION SEASON OF 1917.

District No.	(5) Quantity of Water in Reservoirs Nov. 1, in Acre Feet	(6) No. of Acre Feet Used from Reservoirs During Season
34	115	1,154
40	4,030	20,309
42	555	9,199
61	....	6,872
Totals	....	37,534

ANNUAL REPORT DIVISION ENGINEER
DIVISION NO. 4—1918

Montrose, Colo., November 30, 1918.

Mr. A. J. McCune,
State Engineer,
Denver, Colorado.

Dear Sir: Herewith is presented my annual report of Irrigation Division No. 4 for the fiscal year ending with this date.

In response to the request of the State Engineer, we attended a meeting in Denver on May 10, 1918, of the State Water Conservation Committee, composed of Mr. John E. Field, Prof. E. B. House and the State Engineer, Mr. A. J. McCune. At this time it was arranged to have Prof. E. B. House, of the State Agricultural College, go over this Division and assist me in holding water conservation meetings in the various districts as a part of the war plan of the Conservation Committee. During the latter part of May, Prof. House held meetings in various districts of this Division, for the purpose of forming organizations in the various districts, to assist the farmers in conserving water to the greatest possible extent, and thereby increasing, as far as possible, the duty of water. These meetings were quite generally attended by water users, and considerable benefit was derived therefrom.

During the past season, gaging stations were established on Leroux Creek, Surface Creek, Paradox Creek, Dolores River, San Miguel River, Tomichi Creek and Kannah Creek. At four of these stations, self-recording gages were installed.

During the past season, a large number of reservoirs located on Grand Mesa installed gaging rods and furnished this office and the State Engineer's office with capacity tables—thus enabling us to have definite knowledge as to the amount of water stored for irrigation purposes in the various reservoirs.

Mr. J. H. Baily, Chief Hydrographer in the State Engineer's office, made several visits to this Division during the season, and assisted us not a little in stream gaging and in promoting the work of this Division. This work of Mr. Baily's, being the first time that this Division was favored by having one of the State Hydrographers assist in rating the various canals and ditches, was very greatly appreciated.

There are in this Division two important Reclamation Projects, viz., The Uncompahgre Project of Montrose, Colo., and The Grand Valley Project of Grand Junction, Colo.

The reports of the Project Managers, Mr. Fred D. Pyle, of The Uncompahgre Project, and Mr. S. O. Harper, of The Grand Valley Project, for the season past, are herewith submitted.

UNCOMPAHGRE VALLEY PROJECT—COLORADO

Fred D. Pyle, Project Manager
United States Reclamation Service
November 1, 1918.

GENERAL PROGRESS

During the past year the following work was accomplished: During the winter of 1917-1918 the concrete work in connection with the Gunnison Tunnel was completed; four short sections, having a total of 137 linear feet, were concreted, walls and roof; 891 linear feet of sidewall lining, located in five places, were concreted; 22 conversions from lined to unlined sections, and *vice versa,* were constructed. Upon the completion of the above work there remained a total of 12,472 feet of unlined tunnel, divided into fifteen sections varying in length from 207 to 2,004 feet. The effective cross-section of the unlined sections was materially increased by careful trimming, so that the unlined sections will have the same capacity as the lined sections; 18,108 feet of the tunnel is lined.

A concrete conversion section, containing 250 cubic yards of concrete, was constructed on the South Canal above Tunnel No. 5. A concrete headgate was constructed to supply water to the High Line Lateral System near Dry Cedar Creek. Two feeder laterals to the High Line were excavated by contract and the necessary structures installed.

The work of enlarging the California Mesa Lateral System was completed by government forces. This work was very difficult on account of trees, brush, gravel, mud, frost and the necessity for doing the work between irrigation seasons. The work of constructing the Ironstone Extension was commenced and a considerable amount of the excavation completed by contract and about 80% of the structures completed by government forces.

A number of minor structures, bridges, checks, culverts, drains, turnouts, wasteways, etc., were built on the various lateral systems, as required by the development of the lands.

Hydrographic investigations were continued in connection with the Taylor-Park Reservoir and the capacity of the Gunnison Tunnel. Observation of the fluctuation of the water level on the seeped areas was continued, also a study of alkali action on concrete blocks.

RESULTS

The following is a brief summary of the results accomplished from July 1, 1917, to June 30, 1918:

Miles of canal constructed	7	
Structures costing over $2,000 each	1	
Structures costing from $500 to $2,000 each	1	
Structures costing from $100 to $500 each	13	
Structures costing less than $100 each	333	
Number of bridges built	28	
Number of culverts built	7	
Excavation, Class 1 Material	60,033	cu. yds.
Excavation, Class 3 Material	573	cu. yds.
Concrete placed	2,509	cu. yds.

The construction work accomplished to date has made it possible to deliver water during the past irrigation season to a total of 85,000 acres, of which amount about 58,000 acres were in crop.

* * * * *

OPERATION

The operating season commenced earlier than usual and lasted until the first of November. The demand during May and June was unusually large—often as high as 1,700 second feet being diverted by government and private canals for the irrigation of about 65,000 acres of crop. The snowfall on the watershed was about normal and the runoff was well distributed, so that practically no water was wasted from the Uncompahgre Valley. Very little trouble was caused by floods during the high water, or by cloudbursts. Project water was delivered on a rental basis of $100.00 per second foot, continuous flow, for the season. The duty of water since 1908, expressed in acre-feet of water delivered per acre of land in crop, has been as follows:

1908	3.71	
1909	4.48	
1910	6.25	
1911	5.44	
1912	4.81	
1913	5.09	
1914	5.06	
1915	5.56	
1916	6.08	
1917	5.96	
1918	5.50	estimated

The rainfall and mean temperature at Montrose, Colorado, for the season of 1917-1918 and the eight-year average were as follows:

	Season of 1917-1918		Eight-year Average	
	Precipitation Inches	Mean Temperature	Precipitation Inches	Mean Temperature
1917				
November	.10	40°	.45	38°
December	......	33°	.76	25°
1918				
January	1.92	21°	.89	24°
February	.49	29°	.49	31°
March	.16	43°	.64	39°
April	1.30	44°	1.06	48°
May		56°	.97	56°
June	.31	71°	.62	66°
July	.87	69°	1.05	71°
August	1.24	69°	1.25	69°
September	1.34	60°	1.11	60°
October	1.53	51°	1.28	46°
Total	9.26		10.57	

No unusual troubles were encountered in operating the project. The principal items of cost in maintaining the project were the removal of weeds and brush from the canals, the sliding of banks and the replacement of structures.

During a part of August and September the flow of the Uncompahgre River dropped to less than 50 second feet and the old priorities were cut accordingly. During a part of July and August the discharge of the tunnel was 891 second feet. The water supply was ample during the entire irrigation season.

* * * * *

GENERAL CONDITIONS

The financial condition of the project farmers continued to improve owing to the good yields and good prices. There was some shortage of labor but this was not sufficiently serious to affect the yields. Livestock conditions have continued to improve and County Agents have been secured by both Montrose and Delta Counties.

An agreement between the United States and the Water Users' Association, executed on May 7, 1918, provides that the water users may take over the operation and maintenance of the project whenever they desire to do so; that the government will operate and maintain the project at cost to the water users; and for the deferment of the first construction charge until December 1, 1922.

Departmental Order of February 21, 1918, opened to entry 116 farm units on April 5, 1918, by a drawing at the local land office. There were 160 applicants and 29 farm units were filed on at that time. At the present time there are 74 farm units still open to entry. Fair progress was made by the new entrymen in developing their lands.

(Signed) FRED D. PYLE.

PROGRESS DURING CALENDAR YEAR 1918

GRAND VALLEY PROJECT, COLORADO

CONSTRUCTION

Canal and Lateral Systems. The first 55 miles of the main canal, extending from the headworks to West Salt Creek, has been completed and seasoned throughout its entire length. A few bridges and other minor structures were installed during the year. On the lateral system extensions were constructed as required to supply water to new lands. A large number of turnouts, weirs, and other minor structures were installed in connection with this work. Two wood stave pipe siphons were also constructed. The lateral system required to supply 35,000 acres of the gravity unit of the project has now been practically completed, except for the installation of turnouts and measuring devices. Permanent buildings were erected during the year for housing the operation and maintenance forces at the two maintenance camps.

Drainage. Late in 1917 a contract was entered into between the United States and the Grand Valley Drainage District providing for the construction of 38 miles of new channels to serve as outlets for the project and drains for the district. The construction of these drains will serve to reclaim a considerable acreage of land in the district, as well as provide permanent outlets for the project. The contract provides that the works are to be constructed at the expense of the project but maintained by the district, which also furnishes the rights of way. Construction work on the co-operative system was commenced in March, 1918, with one trenching machine and one dragline excavator. A second dragline excavator was put in operation in May. At the end of the year one mile of closed drain and five miles of open drain had been completed, involving the excavation of 135,000 cubic yards of earth. Three railroad culverts were constructed to carry the open drains under the tracks of the Denver & Rio Grande Railroad and work was in progress on the additional culverts required. A third dragline excavator will be put in operation early in 1919.

Construction Results. The following is a brief summary of work performed during the period July 1, 1917, to June 30, 1918, and the total to the latter date:

ITEM	July 1, 1917 to June 30, 1918	Total to June 30, 1918
Miles of canal constructed	4.3	236.6
Structures costing over $2,000	0	31
Structures costing $500 to $2,000	2	111
Structures costing $100 to $500	12	198
Structures costing less than $100	305	2,671
No. of bridges built	47	196
No. of culverts built	40	210
Length of pipe laid, 1 ft.	3,661	36,329
No. of flumes built	6	75
Excavation—		
Class 1—Cu. yds.	89,228	3,112,254
Class 2—Cu. yds.	880	485,776
Class 3—Cu. yds.	0	186,001
Total	90,108	3,784,031
Riprap placed, cu. yds.	446	7,710
Paving placed, sq. yds.	0	18,392
Concrete placed, cu. yds.	109	55,186

* * * * *

OPERATION AND MAINTENANCE

Water was turned into the main canal at the beginning of the irrigation season, on April 1st, and the irrigation system was operated continuously throughout the season. Fifty-five miles of main canal and 105 miles of laterals were operated. No particular maintenance difficulties were experienced and water was delivered with but little interruption to all water users desiring it. Water was delivered on demand on a rental basis, at the rate of fifty cents per acre-foot.

Approximately 9,000 acres of land were cultivated during the season, which represents an increase of 100 per cent over the last year. The dry, dusty spring made it difficult to secure a good stand of certain crops, but taken as a whole the season was a very favorable one and the warm weather was conducive to the rapid growth of all crops. Alfalfa, sugar beets, and corn gave exceptionally good yields. Wheat and oats were not quite up to the average. The tomato crop was an excellent one under the project and the absence of killing frosts in the fall gave opportunity to continue the tomato harvest until the last of October. All crops brought excellent prices and the season was a prosperous one for the great majority of the project farmers.

SETTLEMENT

On March 29 102 farm units, comprising about 5,000 acres of vacant public lands, were thrown open to entry. At the end of the year all but 25 of these units had been filed on. Considerable progress has also been made in the settlement of the private lands under the project, but all settlement and development has been retarded on account of war conditions.

* * * * *

Page 471, Session Laws of Colorado, 1911, a portion of Sec. 1 reads as follows:

> "The Secretary of State shall provide a suitable office for each Division Engineer, and shall supply him with suitable furniture and office equipment for the proper transaction of the business and preservation of the records of the irrigation division."

The Secretary of State has been unable to comply with the above provision, for the reason that the State Legislature fails to make an appropriation for the purposes above stated. An effort should be made to induce the State Legislature to make an appropriation sufficient to maintain offices for the Division Engineers, as set forth in the above statute.

Page 473, Sec. 11 of Session Laws of Colorado, 1911, reads as follows:

> "The clerk of any court in this state issuing judicial decrees fixing the priorities of appropriation of water for irrigation and other beneficial purposes in any of such divisions, shall within ten days after such decrees have been entered, forward by registered mail one certified copy of said decree to the State Engineer, and one certified copy to the Irrigation Division Engineer having jurisdiction over the water district in which said decree shall have been entered, as heretofore provided by law in the case of superintendents of irrigation."

It is my experience that it is very difficult to compel the various clerks of the District Court to furnish the State Engineer's office and the Division Engineer's office with certified copies of judicial decrees. I therefore recommend that this section be amended, so that no decree issued by any court shall be binding until the State Engineer's office and the Division Engineer's office are furnished with certified copies, as above statute provides.

Attached to this report is the tabulated statement of Water Commissioners' reports.

This office is greatly indebted to the State Engineer's office for the hearty support it has always given us, and for courtesies extended by different members in the department of the State Engineer.

Yours very respectfully,

H. C. GETTY,
Irrigation Division Engineer,
Division No. 4.

IRRIGATION DIVISION NO. 4

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

(1) District	(2) No. of Ditches Reported	(3) Amount of Appropriation in Second Feet	(4) Capacity of Ditches in Second Feet	(5) Length of Main Ditches in Miles	(6) Length of Laterals in Miles
28	195	287	1,391	93	......
30	21	290	338½	72	68
33	38	......	660	98	49
34	66	229	237	72	79
40	137	571	880	483½	132
41	30	800	2,333	269½	410
42	58	341	494	96	......
61	14	14	56	18	5
62	10	91	91	35	......
68	94	455	648	211¼	......

NOTE.—No reports from Districts Nos. 29, 31, 32, 59, 60, 63, and 69. Acreage given includes all area irrigated by both ditch and reservoir.

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON OF 1918.

District	(7) First Day Water Diverted from Natural Streams for Irrigation	(8) Last Day Water Diverted from Natural Streams for Irrigation	(9) Maximum No. Days Water Diverted from Natural Streams for Irrigation	(10) Average Daily Amount Water Diverted by Ditches During Season from Natural Streams for Irrigation Second Feet
28	April 1	August 1	112	385
30	April 10	October 31	190	197
33	May 1	September 11	128	157¼
34	April 1	September 15	138	183
40	April 1	October 20	190	657
41	March 1	October 30	210	1,286
42	April 20	October 1	153	178
61	April 1	September 30	163	13
62	April 15	....	......	....
68	April 1	November 15	210	....

IRRIGATION DIVISION NO. 4

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON 1918.

District	(11) No. of Acre Ft. Diverted by Ditches During Season from Natural Streams for Irrigation	(12) Total No. of Acres that can be Irrigated	(13) Alfalfa	(14) Natural Grasses	(15) Cereals
28	70,850	23,478	164	22,292	200
30	62,293	26,955	4,988	623	5,668
33	27,427	42,510	9,524	20	7,925
34	33,419	9,955	3,476	1,452	2,381
40	187,856	65,673	29,349	1,227	12,907
41	518,540	106,600	21,275	805	21,100
42	32,343	15,958	11,926	2,516	2,790
61	2,282	2,700	634	30	54
62	....	1,430	786	210	173
68	....	29,458	4,024½	2,731½	2,952½
Totals	....	324,717	86,146½	31,906½	56,150½

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL DITCH REPORTS FOR THE IRRIGATION SEASON 1918.

District	(16) Orchards	(17) Market Gardens	(18) Potatoes	(19) Sugar Beets	(20) Timothy	(21) Other Crops	(22) Total No. Acres Irrigated
28	....	....	33	....	....	....	22,689
30	76	11	167	....	....	....	11,533
33	45	....	180	....	....	410	18,104
34	56½	61¾	202½	....	....	7	7,636¾
40	7,336	369	1,141	325	....	2,220	54,874
41	4,330	2,542	10,655	1,415	....	2,360	64,482
42	402	34	243	43	....	162	18,126
61	27	....	2	....	....	72	819
62	....	....	30¾	....	....	....	1,199¾
68	57	54⅛	328⅛	39½	6,087½	....	16,275½
Totals	12,329½	3,071⅞	12,982⅜	1,822½	6,087½	5,331	215,739

IRRIGATION DIVISION NO. 4

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL RESERVOIR REPORTS FOR THE IRRIGATION SEASON 1918.

District	(1) No. of Reservoirs Reported	(2) Area of High Water Line (Acres)	(3) Capacity of Reservoirs in Acre Feet	(4) Quantity of Water in Reservoirs May 1, in Acre Ft.
34	2	125	1,294	897
40	91	2,835	29,539	27,789
42	33	312.27	10,415	10,230
61	1	300	4,600	None
Totals	127	3,572.27	45,848	38,916

TABULATED STATEMENT OF WATER COMMISSIONERS' ANNUAL RESERVOIR REPORTS FOR THE IRRIGATION SEASON 1918

District	(5) Quantity of Water in Reservoirs Nov. 1, in Acre Feet	(6) No. of Acre Feet Used from Reservoirs During Season
34	None	825
40	218	28,641
42	None	8,460
61	248	3,260
Totals	466	41,186

ANNUAL REPORT OF IRRIGATION DIVISION ENGINEER, DIVISION NO. 5—1917

Glenwood Springs, Colo., November 30, 1917.

Mr. Addison J. McCune,
State Engineer,
Denver, Colorado.

Dear Sir: In accordance with the law, I herewith present for your consideration my annual report as Irrigation Division Engineer for Irrigation Division No. 5, for the season of 1917.

The season just closing has been one of reasonably favorable conditions throughout the division, no unusual difficulties being encountered in any of the districts. The season was very late last spring and the heavy precipitation caused by late snows and early rains made it impossible for farmers to finish their spring work of plowing and seeding at the usual time, some of the grain crops being planted as late as the early part of June, this of necessity resulting in late harvests and in some cases, immature crops.

However, crops that were well started made a splendid growth and the natural moisture in the soil made the usual amount of irrigation unnecessary. As a rule very satisfactory crops were raised, although for most crops the yield was not as heavy as last year, and the impossibility of securing needed help at harvest time caused a heavy loss from frost of some crops, particularly apples and potatoes. The loss of potatoes by frost in Garfield County amounted to several hundred carloads. Much of this loss could have been prevented if the tubers had ripened at the usual time, but owing to the lateness of the planting the ripening period was correspondingly late and farmers, desirous of carrying their crops to the last degree of maturity possible, dallied too long with the weather, and at a tremendous cost to their bank accounts. The same conditions were largely true as to apples.

Considerable beans were planted in districts 38, 39, 45 and 70, but this crop was purely in the nature of an experiment, only small areas of beans having been heretofore grown in this division. They were nearly all of the Pinto or Mexican variety, and were planted as early as the soil could be prepared and the frost conditions would permit. However, but very few were ripened and the farmers have learned that unless spring conditions favor a reasonably early planting, the attempt to grow beans in this division will almost surely end in failure. Sugar beets are grown to considerable extent in the vicinity of New Castle and west to the Mesa County line, and the yield this year was very satisfactory. During the past two years the dairy business has received a considerable impetus in Carbondale, Glenwood, New Castle and Rifle vicinities and considerable corn has been grown and several silos have been constructed, principally of the bank variety. As a rule throughout the division the alfalfa fields this year produced almost as much hay for the first cutting as the same area ordinarily would yield in two cuttings, and yet there is considerable complaint of a shortage of hay in the country. This is principally due to the fact that the live stock business has been given a decided impetus during the past two years.

There has perhaps been as little dissatisfaction the past year concerning the distribution of water as at any like period in the history of the country, although some complaint has been made concerning the incompetency or indifference of the Water Commissioners or their deputies in some districts. I realized, in some instances at least, the justice of these complaints, and did the best I could to correct the evils, but so long as we must endure the present system of appointing Water Commissioners and also the present inexcusable plan for paying them for their services, or rather of paying their bills as they file them with the County Commissioners, just so long must we expect trouble which the Division Engineers are powerless to cure. There will never be a proper solution of this problem, I am convinced, until Water Commissioners are appointed by the State Engineer, upon the recommendation of the Division Engineers, and are paid out of state funds, and thus removed as far as possible from local political influences.

In Division No. 5 very little ditch or reservoir construction was completed the past year, although many ditches and reservoirs were adjudicated in the courts. In this connection it is worthy of note that the courts no longer issue conditional decrees, such as were all too common in the early days of the development of the state, and which, even to this day, cause much trouble to water users as well as water officials. In District 45 the validity of conditional decrees has been assailed this season as never before. These conditional decrees have heretofore been recognized by water officials, to the extent of sufficient water for the land under cultivation, and I have declined to change the custom, not desiring to place myself in the position of a court, passing on the question of "reasonable diligence," but I have encouraged the parties to go before the court and have their rights determined, and their conditional decrees made absolute. I think this is the proper solution of the question and the only fair treatment to the Water Commissioners. These early conditional decrees as well as those which pretend to adjudicate water for "irrigation and domestic purposes" and those others which authorize and sometimes command the Water Commissioners to distribute water to lateral headgates have been the source of a great trouble to Water Commissioners, some of whom interpreted all of these as mandatory.

I have had a little trouble in District 39 over the question of damage by waste water, but as the party complaining refused to allow the ditch owners to abate the trouble by building a waste ditch over a very small portion of his ranch where it would do him no harm, the justice of his complaint failed to impress me to any great extent. After listening to both sides of the controversy and making a careful personal examination of the ground I admonished the ditch owners that they must use the water with as little waste as possible, and this they promised to do, and I have heard but little further complaint.

I have not been able to secure from all the commissioners their annual reports and field books, but such as I have been able to obtain I am forwarding to you. I hope to receive others in a short time and will forward them to your office as soon as received.

Thanking you for courtesies received from your office during the year and trusting that the pleasant relations may continue, I am,

Yours very truly,

A. J. DICKSON,

Irrigation Division Engineer, Division No. 5.

ANNUAL REPORT OF THE IRRIGATION DIVISION ENGINEER FOR IRRIGATION DIVISION NO. 5—1918

Glenwood Springs, Colo., November 26, 1918.

Hon. Addison J. McCune,
State Engineer,
Denver, Colorado.

Dear Sir: In accordance with the law, I beg to submit for your consideration my annual report as Irrigation Division Engineer of Irrigation Division No. 5, for the season of 1918.

While the season just closing has been one of great stress and many disappointments, these have been due to war conditions and the shortage of irrigation water in Division No. 5.

Generally speaking, the conditions have been very favorable and the water supply quite satisfactory throughout the district. The spring opened earlier than last year, and in consequence all crops matured at an earlier date, the products in the main being of better quality. Not only was the spring season earlier than last year, but the autumn frosts were very accommodating and delayed their visit to a later date than usual, as though to compensate the farmer as much as possible for the war-forced shortage in harvest help. Thus a season which begun with many misgivings and numerous predictions of disaster and ruin, was brought to a very successful close.

In a small portion of my district, that along the Grand River west of New Castle, sugar beets have been grown to a considerable extent this year. The yield on this crop has been very good, the prices quite satisfactory and prompt payments have been made by the factory, thus turning loose considerable sums of money in the sugar beet area. I am confident that the beet area in this division will be materially increased next year.

I referred in my report of last year to the experiment being made with beans of the Pinto and Navy varieties, but the experiment proved rather discouraging, owing to the late spring and early fall, and this year I think the bean acreage was less than last year, but the yield was better and I understand the price was quite satisfactory.

Early in the season an effort was made on the part of the Colorado Council of Defense to have the waters of the state utilized in a more equitable manner and to the greater benefit of the people, the state and the nation by the production of a greater aggregate crop than formerly, and thus to give greater aid to the general war conditions. This movement involved a partial setting aside of the decrees for the time being, or rather a liberal construction of the decrees and a more neighborly enforcement of the same than had ever prevailed before. The Council of Defense appointed a committee to go through the country and in company with the water officials to visit the water users in the various districts, and to make a plea for the increased aggregate production of crops as a war measure. I was fortunate in having as my companion on this journey of education, as it was intended to be, the Hon. State Engineer, but, owing to the brief time in which the meetings were advertised, and the fact that the farmers were extremely busy, the attendance was very light, and the interest, I think, was not what had been expected. We found that there was very little disposition on the part of those with good water rights to share those rights with their neighbors, even for the laudable purpose of producing greater crops for our allied soldiers. I think this was not altogether due to selfishness, but partially through a fear that a precedent might be established which irrigation officials or others might insist on in later years, at least to as great an extent as could be done without fracturing the law.

I cannot say that I observed any good results from the effort of the committee in my territory, except perhaps in one instance, that being a case where several parties with good water rights, each consented to loan for ten days a portion of his allowance to a neighbor with an inferior right in order that the neighbor might mature a crop of wheat. These generous (?) individuals had their crops well irrigated, in my judgment did not need the water, and in giving it or loaning it to their needy neighbor did not deny themselves anything, and if Water Commissioners had the control over water which I believe they ought to have, they could have taken it and given it to the needy neighbor without the formality of a so-called loan. I think the parties who made this loan were none of them at any of our meetings, but it is just probable that what they heard of them might have appealed a bit to their generosity.

I am quite sure that a great many water owners would be more generous and liberal toward a less fortunate neighbor, were it not for their belief that to do so is a dangerous practice and liable to operate to the jeopardy of their title to at least a part of their water. In fact, we were told by farmers in the meeting that they had been informed by lawyers that if they allowed a neighbor to use a part of their water for two years in succession, the neighbor could claim it as a right forever afterwards. If the State Engineer or his attorneys are advised of any real danger along this line, I hope they will enlighten us on the subject very soon.

I have had but very little trouble this year in the enforcement of the water laws. In District No. 38, the Water Commissioner was obliged to proceed against one of the pioneer citizens of the community, under the section of the statutes relating to the interference with dams and headgates. The ranchman aggrieved by the illegal transaction has also filed a private suit for damages. A conviction on the first charge was secured before a justice of the peace at Basalt, but the defendant appealed the case to the County Court of Red Cliff and it has not yet been set for trial.

I am obliged to confess that the irrigation service of this state is not what it should be, but it will never be much better until the legislature gives some heed to the advice of the State Engineer and the Division Engineers and changes the machinery so that effective work may be done. I need hardly state that I refer to the necessity of having Water Commissioners appointed by the State Engineer, upon the endorsement of the Division Engineers, thus removing the appointment from political influences and insuring the selection of men of greater fitness for the work. It will also be necessary to remove the limit placed on the wages of Deputy Water Commissioners before we can reasonably expect much service from the deputies. This matter has been so frequently discussed in these reports, with no results, that it seems a waste of time, effort and thought, and I will not give it further attention.

The death on October 28, of Mr. Charles M. White, Water Commissioner of District No. 39, and the death on November 6, of Mr. Curtis Jessup, and the illness in the families of several other commissioners and deputies, has made it impossible for me to secure complete reports from the various districts, and I fear that in some instances these reports can never be obtained. I will check over and forward to you at the earliest time possible such reports as I am able to obtain.

Thanking you for many official courtesies extended by your office, I beg to remain,

Yours very truly,

A. J. DICKSON,
Irrigation Division Engineer, Division No. 5.

CHAPTER VIII

HYDROGRAPHIC DATA

J. H. Baily, Chief Hydrographer

ARKANSAS DRAINAGE

M. N. Grant, Jr., Hydrographer

TENNESSEE FORK NEAR LEADVILLE

Location.—At highway bridge in Sec. 16, T. 9 S., R. 80 W., a few hundred yards above the mouth of the stream and about three miles northwest of Leadville.

Records Available.—May 10 to October 31, 1890; June 18 to October 16, 1903; February 8, 1911, to October 30, 1918.

Drainage Area.—45 square miles.

Gage.—Vertical staff.

Channel.—Rough, but practically permanent.

Discharge Measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter Flow.—Ice causes backwater during the winter months.

Diversions.—There are court decrees for diversions of 24 second-feet above the station. There is also a decree for diversion of 18.5 second-feet from the headwaters of Eagle River to Tennessee Fork above the station.

Co-operation.—Station maintained by the United States Geological Survey in co-operation with the United States Forest Service. Records were furnished by the United States Geological Survey.

EAST FORK OF ARKANSAS RIVER NEAR LEADVILLE

Location.—At highway bridge in Sec. 16, T. 9 S., R. 80 W., about 200 yards above mouth of Tennessee Fork, three miles northwest of Leadville.

Records Available.—April 25 to August 31, 1890; June 18 to September 29, 1903; June 5, 1911, to November 5, 1918.

Drainage Area.—52 square miles.

Gage.—Vertical staff.

Channel.—Somewhat shifting.

Discharge Measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter Flow—Ice causes backwater during the winter months.

Diversions.—There is a court decree for a diversion of 2 second-feet from the East Fork above the station by the Leadville Water Company.

Accuracy.—Results considered fair.

Co-operation.—Station maintained by the United States Geological Survey in co-operation with the United States Forest Service. Records furnished by the United States Geological Survey.

Discharge of Tennessee Fork at Leadville for 1917.

Drainage Area, 45 Square Miles. Altitude 10,000 Feet Above Sea Level

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	98	160	38	8	5.0	......	......
2	......	......	......	......	......	93	155	23	7	5.0	......	......
3	......	......	......	......	......	102	144	18	5	5.0	......	......
4	......	......	......	......	......	117	115	18	5	5.6	......	......
5	......	......	......	......	......	125	110	13	4	4.4	......	......
6	......	......	......	......	......	133	107	10	4	3.5	......	......
7	......	......	......	......	2.8	125	102	13	6	4.4	......	......
8	......	......	......	......	......	155	93	12	6	5.0	......	......
9	......	......	......	......	......	172	86	9	6	3.8	......	......
10	......	......	......	......	......	180	75	6	10	4.4	......	......
11	......	......	......	......	......	169	90	6	9	5.0	......	......
12	......	......	......	......	......	177	90	6	11	5.0	......	......
13	......	......	......	......	......	177	79	7	10	4.4	......	......
14	......	......	......	......	......	160	79	6	9	2.6	......	......
15	......	......	......	......	......	155	62	6	11	2.6	......	......
16	......	......	......	......	......	133	46	5	11	2.3	......	......
17	......	......	......	......	......	152	32	4	10	2.0	......	......
18	......	7.5	......	......	......	177	36	5	10	2.0	......	......
19	......	......	......	......	......	194	38	5	8	2.0	......	......
20	......	......	......	......	......	224	40	4	8	2.0	......	......
21	......	......	......	......	......	240	48	5	10	2.0	......	......
22	......	......	......	......	......	256	58	4	6	2.0	......	......
23	8.2	......	......	......	......	256	128	6	6	1.8	......	......
24	......	......	......	......	......	224	64	5	6	1.8	......	......
24	......	......	......	......	......	209	54	4	8	1.4	......	......
26	......	......	......	......	......	209	48	3	6	1.0	......	......
27	......	......	......	......	77	191	36	4	5	1.0	......	......
28	......	......	......	......	86	172	38	6	5	1.0	......	......
29	......	......	......	......	77	163	33	4	5	1.0	......	......
30	......	......	......	......	70	160	36	4	5	1.0	......	......
31	......	......	......	......	88	......	23	6	....	1.0	......	......
Total	......	......	......	......	......	5098	2305	265	220	91.0	......	......
Mean	......	......	......	......	......	170	74.4	8.5	7.3	2.94	......	......
Max	......	......	......	......	......	256	160	38	11	5.6	......	......
Min	......	......	......	......	......	93	23	3	4	1.0	......	......
Acre-ft.	......	......	......	......	......	10100	4570	523	434	181	......	......

Discharge of Tennessee Fork near Leadville for 1918.

Drainage Area 45 Square Miles. Altitude 10,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	194	86	23.0	6.2	11.0	......	......
2	......	......	......	......	......	194	84	21.0	8.0	11.0	......	......
3	......	......	......	......	......	209	84	19.0	8.0	11.0	......	......
4	......	......	......	......	......	256	77	19.0	9.8	11.0	......	......
5	......	......	......	......	......	256	70	19.0	10.0	11.0	......	......
6	......	......	......	......	......	290	66	17.0	10.0	9.8	......	......
7	......	......	......	......	......	290	77	15.0	8.0	8.6	......	......
8	......	......	......	......	......	308	98	15.0	9.8	8.0	......	......
9	......	......	......	......	......	360	77	19.0	11.0	8.0	......	......
10	......	......	......	......	......	360	66	19.0	33.0	8.0	......	......
11	......	......	......	......	......	360	66	19.0	33.0	6.2	......	......
12	......	......	......	......	......	395	66	19.0	24.0	6.2	......	......
13	......	......	......	......	......	395	62	19.0	19.0	6.2	......	......
14	......	......	......	......	......	412	56	17.0	15.0	6.2	......	......
15	......	......	......	......	......	325	56	15.0	14.0	6.2	......	......
16	......	......	......	......	......	395	46	15.0	12.0	6.2	......	......
17	......	......	......	......	......	395	46	15.0	11.0	8.0	......	......
18	......	......	......	......	......	378	56	15.0	11.0	8.0	......	......
19	......	......	......	......	......	360	56	15.0	11.0	9.8	......	......
20	......	......	......	......	224	360	46	13.0	9.8	9.8	......	......
21	......	......	......	......	224	342	46	13.0	9.8	11.0	......	......
22	......	......	......	......	209	308	46	11.0	8.0	11.0	......	......
23	......	......	......	......	256	325	46	11.0	8.0	11.0	......	......
24	......	......	......	......	256	290	46	11.0	8.6	11.0	......	......
25	......	......	......	......	273	256	43	11.0	11.0	11.0	......	......
26	......	......	......	......	273	256	38	9.8	11.0	11.0	......	......
27	......	......	......	......	273	256	36	8.6	11.0	11.0	......	......
28	......	......	......	......	240	224	32	8.0	11.0	11.0	......	......
29	......	......	......	......	240	194	29	8.0	11.0	11.0	......	......
30	......	......	......	......	224	88	26	7.4	11.0	11.0	......	......
31	......	......	......	......	194	......	24	6.2	......	11.0	......	......
Total	......	......	......	......	2886	9031	1753	453	374	291.2	......	......
Mean	......	......	......	......	240	301	56.5	14.6	12.5	9.39	......	......
Max	......	......	......	......	273	412	98	23	33	11	......	......
Min	......	......	......	......	194	88	24	6.2	6.2	6.2	......	......
Acre-ft.	......	......	......	......	5710	17900	3470	898	744	577	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of East Fork Arkansas River at Leadville for 1917.
Drainage Area 52 Square Miles. Altitude 10,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	37	235	47	12	6	5	......
2	......	......	......	......	......	36	270	44	11	5	......	......
3	......	......	......	......	......	31	191	50	8	5	......	......
4	......	......	......	......	......	37	171	52	12	5	......	......
5	......	......	......	......	......	48	163	50	16	5	......	......
6	......	......	......	......	......	48	175	52	20	6	......	......
7	......	......	......	......	5	58	171	54	17	6	......	......
8	......	......	......	......	......	75	171	47	17	5	......	......
9	......	......	......	......	......	80	159	47	16	5	......	......
10	......	......	......	......	......	99	134	44	12	6	......	......
11	......	......	......	......	......	115	138	50	8	8	......	......
12	......	......	......	......	......	127	127	48	6	6	......	......
13	......	......	......	......	......	175	124	37	5	5	......	......
14	......	......	......	......	......	215	117	29	8	5	......	......
15	......	......	......	......	......	270	104	29	5	6	......	......
16	......	......	......	......	......	322	92	20	5	6	......	......
17	......	......	......	......	......	415	89	16	5	5	......	......
18	......	9.5	......	......	......	448	72	16	5	6	......	......
19	......	......	......	......	......	415	80	16	6	9	......	......
20	......	......	......	......	......	415	72	16	5	12	......	......
21	......	......	......	......	......	382	84	16	6	5	......	......
22	......	......	......	......	......	415	89	16	5	6	......	......
23	9.1	......	......	......	......	415	179	16	5	5	......	......
24	......	......	......	......	......	415	89	16	5	5	......	......
25	......	......	......	......	......	382	84	16	5	5	......	......
26	......	......	......	......	......	382	66	13	5	6	......	......
27	......	......	......	......	31	350	62	12	5	8	......	......
28	......	......	......	......	26	350	50	11	8	6	......	......
29	......	......	......	......	31	350	48	12	8	6	......	......
30	......	......	......	5	37	350	47	16	6	5	......	......
31	......	......	......	......	40	......	48	13	......	5	......	......
Total	......	......	......	......	......	7257	3701	921	257	184	......	......
Mean	......	......	......	......	......	242	119	29.7	8.6	5.9	......	......
Max	......	......	......	......	......	448	270	54	20	12	......	......
Min	......	......	......	......	......	31	47	11	5	5	......	......
Acre-ft	......	......	......	......	......	14400	7320	1830	512	363	......	......

Discharge of East Fork of Arkansas River Near Leadville for 1918.
Drainage Area, 52 Square Miles. Altitude, 10,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	127	148	34	16	16	12	......
2	......	......	......	......	......	148	138	34	19	16	12	......
3	......	......	......	......	......	183	134	36	21	14	12	......
4	......	......	......	......	......	220	124	34	21	14	12	......
5	......	......	......	......	......	265	120	36	22	13	12	......
6	......	......	......	......	......	322	124	36	20	12	......	......
7	......	......	......	......	......	350	99	31	16	12	......	......
8	......	......	......	......	......	415	120	28	20	12	......	......
9	......	......	......	......	......	480	120	36	26	12	......	......
10	......	......	......	......	......	512	120	42	42	12	......	......
11	......	......	......	......	......	615	115	42	37	12	......	......
12	......	......	......	......	......	650	107	42	33	12	......	......
13	......	......	......	......	......	650	104	40	29	12	......	......
14	......	......	......	......	......	580	99	37	28	12	......	......
15	......	......	......	......	......	350	94	34	26	12	......	......
16	......	......	......	......	......	322	94	34	22	12	......	......
17	......	......	......	......	......	275	94	34	21	12	......	......
18	......	......	......	......	......	285	89	34	21	13	......	......
19	......	......	......	......	......	270	82	34	20	13	......	......
20	......	......	......	......	148	255	82	31	17	12	......	......
21	......	......	......	......	163	240	75	29	16	12	......	......
22	......	......	......	......	134	270	60	28	16	12	......	......
23	......	......	......	......	195	322	70	28	16	12	......	......
24	......	......	......	......	225	350	70	26	16	12	......	......
25	......	......	......	......	270	285	68	24	16	12	......	......
26	......	......	......	......	285	205	66	21	14	12	......	......
27	......	......	......	......	255	175	52	21	16	12	......	......
28	......	......	......	......	275	159	47	20	16	12	......	......
29	......	......	......	......	255	148	42	17	16	12	......	......
30	......	......	......	......	255	155	42	16	16	12	......	......
31	......	......	......	......	187	......	37	16	......	12	......	......
Total	......	......	......	......	2647	9583	2836	955	635	387	60	......
Mean	......	......	......	......	221	319	91.5	30.8	21.2	12.5	12.0	......
Max	......	......	......	......	285	650	148	42	42	16	12.0	......
Min	......	......	......	......	134	127	37	16	14	12	12.0	......
Acre-ft	......	......	......	......	5260	19000	5630	1890	1260	769	119	......

Unless otherwise noted, all discharges are in cubic feet per second.

ARKANSAS RIVER AT GRANITE

Location.—At Granite, in Sec. 31, T. 11 S., R. 79 W., below the mouth of Lake Creek and above Lost Canyon and Clear Creeks.

Records Available.—May 1, 1897, to September 10, 1899; April 6, 1910, to December 31, 1918.

Drainage Area.—425 square miles.

Gage.—Automatic recording gage established in 1910; datum of recording gage bears no determined relation to that of the vertical staff gage which was used from 1897 to 1899, and which was located at the highway bridge near the railroad station. During 1916 the automatic gage was out of order and estimates are based on readings of the staff gage.

Channel.—Practically permanent.

Discharge Measurements.—Made from car and cable.

Winter Flow.—Ice causes backwater during the winter months and the records are discontinued.

Artificial Control.—The discharge is affected by the operation of the Twin Lakes reservoir.

Diversions.—There are court decrees for diversions of 76 second-feet from the Arkansas betwen this station and the junction of Tennessee and East Forks, and diversions of 22 second-feet from the intervening tributaries.

Co-operation.—Station has been maintained in co-operation with the United States Geological Survey during 1917.

ARKANSAS RIVER AT SALIDA

Location.—At Salida, Colorado, some distance above the mouth of the South Fork of Arkansas River, the nearest tributary of importance.

Records Available.—April 11, 1895, to October 31, 1903; November 3, 1909, to December 31, 1918.

Drainage Area.—1,160 square miles.

Gage.—Automatic recording gage; no determined relation between automatic gage and the gage used from 1895 to 1903.

Channel.—Slightly shifting.

Winter Flow.—Springs keep the river open during the winter months.

Diversions.—There are court decrees for diversions of 199 second-feet from the Arkansas between this station and Granite, and diversions of 380 second-feet from intervening tributaries.

Co-operation.—This station has been maintained in co-operation with the U. S. Geological Survey during 1917.

Discharge of Arkansas River at Granite for 1917.

Drainage Area, 425 Square Miles. Altitude, 8,930 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	88	115	615	1910	870	502	103	......	......
2	......	......	......	100	165	550	1810	685	496	103	......	......
3	......	......	......	100	130	563	1810	520	520	103	......	......
4	......	......	......	88	148	664	1710	402	454	106	......	......
5	......	......	......	130	148	785	1710	460	478	106	......	......
6	......	......	......	115	115	643	1660	550	502	95	......	......
7	......	......	......	100	115	800	1610	792	248	109	......	......
8	......	......	......	130	130	800	1710	792	124	109	......	......
9	......	......	......	148	115	1110	1950	910	148	112	......	......
10	......	......	......	148	130	1490	1540	990	154	112	......	......
11	......	......	......	130	130	1810	1290	950	158	100	......	......
12	......	......	......	148	130	1910	1240	910	162	100	......	......
13	......	......	......	165	148	2030	1200	615	224	115	......	......
14	......	......	......	182	268	2130	1200	520	335	118	......	......
15	......	......	......	200	360	2300	1200	520	392	118	......	......
16	......	......	......	148	544	2350	1110	490	397	106	......	......
17	......	......	......	115	643	2420	1110	430	325	92	......	......
18	......	......	......	115	762	2470	1060	424	208	80	......	......
19	......	......	......	115	838	2540	1290	397	196	95	......	......
20	......	......	......	115	894	2340	1240	392	204	82	......	......
21	......	......	......	148	894	2210	1110	340	186	85	......	......
22	......	......	......	240	870	2210	1240	248	190	98	......	......
23	......	......	......	220	870	2260	1290	208	190	72	......	......
24	......	......	......	260	846	2210	1390	168	193	100	......	......
25	......	......	......	220	629	2210	1440	151	176	115	......	......
26	......	......	......	240	514	2110	1390	148	179	......	......	......
27	......	......	......	182	514	2010	1240	130	162	......	......	......
28	......	......	......	148	496	2010	1110	514	148	......	......	......
29	......	......	......	115	466	1960	1060	608	130	......	......	......
30	......	......	......	115	538	2010	1020	570	100	......	......	......
31	......	......	......	......	602	......	934	563	......	......	......	......
Total..	......	......	......	4468	13267	51520	42584	16267	7881	......	......	......
Mean......	......	......	......	149	428	1720	1370	525	263	......	......	......
Max.	......	......	......	260	894	2540	1950	990	520	......	......	......
Min.........	......	......	......	88	115	550	934	130	100	......	......	......
Acre-ft...	......	......	......	8870	26300	102000	84200	32300	15600	......	......	......

Discharge of Arkansas River at Granite for 1918.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	36	88	73	100	206	1110	744	330	470	182	232	48
2	36	88	73	100	210	1050	690	375	420	174	232	48
3	36	88	73	106	198	1160	654	605	420	216	237	62
4	36	65	73	100	295	1230	672	590	414	256	232	48
5	36	69	72	90	400	1280	672	518	420	160	237	57
6	36	88	71	76	484	1320	666	447	300	168	229	66
7	40	85	70	86	498	1280	702	405	348	174	221	76
8	41	88	69	88	568	1620	806	429	297	170	190	48
9	40	88	68	115	696	2170	924	450	345	170	203	62
10	36	73	67	115	638	2560	988	550	360	174	216	48
11	28	88	67	112	540	2630	1040	605	330	180	242	48
12	28	85	67	158	526	2490	940	595	294	174	190	36
13	28	88	36	186	533	2510	924	621	259	174	190	26
14	28	80	12	202	452	2430	738	585	242	174	150	36
15	36	73	11	182	400	2200	684	570	270	166	110	36
16	30	80	25	182	505	2070	828	526	285	160	110	36
17	45	88	43	166	645	2210	792	366	270	166	110	48
18	45	88	58	162	760	1860	708	300	259	172	110	48
19	33	88	61	146	922	1440	648	248	242	172	92	48
20	36	80	61	210	1170	1090	565	224	237	172	31	36
21	36	70	63	150	1160	1080	462	190	216	190	62	62
22	36	76	67	198	1150	1180	462	170	188	182	92	55
23	36	75	67	235	1150	1030	402	164	200	174	31	48
24	36	74	78	215	1270	904	375	170	200	174	31	62
25	36	73	109	215	1350	949	369	245	190	190	36	62
26	36	85	61	255	1340	841	345	285	190	216	48	48
27	36	81	56	250	1120	904	339	282	186	211	62	48
28	40	73	100	198	1170	931	360	300	182	242	48	48
29	65	......	78	194	1160	877	336	458	174	242	48	48
30	88	......	100	182	1110	814	342	482	182	229	48	48
31	88	......	100	......	1180	......	336	470	......	216	......	48
Total..	1243	2272	2029	4774	23806	45220	19513	12555	8390	5820	4070	1538
Mean......	40.1	81.1	65.5	159	768	1510	629	405	280	188	136	49.6
Max.	88	88	109	255	1350	2630	1040	621	470	256	242	76
Min.........	28	65	11	76	198	814	336	164	174	160	31	26
Acre-ft...	2470	4500	4030	9460	47200	89800	38700	24900	16700	11600	8090	3050

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Arkansas River at Salida for 1917.

Drainage Area, 1,160 Square Miles. Altitude, 7,038 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	272	250	212	265	248	708	3520	1460	735	270	305	270
2	272	250	225	242	265	708	3520	1310	680	270	305	270
3	260	235	225	248	260	580	3300	1160	680	270	305	255
4	272	230	208	222	260	708	3300	1000	680	270	305	240
5	250	242	212	240	280	850	3080	970	680	255	305	202
6	272	242	238	265	272	850	2880	1000	680	240	305	218
7	272	235	212	230	248	880	2680	1030	680	246	305	235
8	270	228	215	222	260	910	2780	1100	410	255	305	252
9	272	228	235	260	260	1200	3080	1030	375	240	270	270
10	262	240	242	280	260	2080	3300	1160	375	240	305	270
11	265	228	240	260	272	2630	2780	1240	375	240	305	270
12	260	232	228	240	285	2730	2580	1200	375	240	305	270
13	255	225	218	255	285	3030	2380	1270	375	240	305	270
14	235	220	218	275	330	3960	2230	1310	535	235	270	270
15	235	212	238	285	430	3960	2230	970	580	228	305	270
16	222	212	242	265	655	4070	2030	970	580	228	305	270
17	235	225	242	250	880	4180	1940	970	558	228	270	255
18	240	212	245	222	1030	4400	1890	970	410	228	270	240
19	248	210	255	222	1160	4510	1840	910	410	228	270	240
20	265	225	255	210	1160	4510	1980	850	375	215	270	240
21	235	222	258	218	1130	4290	1670	850	375	235	270	240
22	218	248	270	270	1030	4200	1580	630	375	240	270	240
23	220	260	258	327	970	4120	1540	680	375	240	270	240
24	208	272	252	324	940	4030	1710	580	375	240	270	215
25	220	272	238	336	880	3940	1940	558	345	240	270	215
26	220	262	245	327	605	3860	2430	546	345	255	270	215
27	232	250	220	303	558	3770	2180	535	345	270	270	215
28	212	225	252	272	535	3590	1840	790	315	270	270	215
29	204	......	282	250	512	3410	1710	790	315	270	270	215
30	220	......	342	240	535	3630	1710	790	285	270	270	215
31	252	......	342	......	605	......	1580	735	......	288	......	215
Total..	7575	6592	7564	7825	17400	86294	73210	29364	13998	7684	8590	7517
Mean......	244	235	244	261	561	2880	2360	947	467	248	286	242
Max.	272	272	342	336	1160	4510	3520	1460	735	270	305	270
Min.........	204	210	208	210	248	580	1540	535	285	215	270	202
Acre-ft.	15000	13100	15000	15500	34500	171000	145000	58200	27800	15200	17000	14900

Discharge of Arkansas River at Salida for 1918.

Drainage Area 1,160 Square Miles. Altitude 7,038 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	212	188	198	266	320	1580	1980	650	820	390	385	266
2	209	188	198	266	320	1380	1620	650	820	390	350	266
3	206	178	242	266	320	1540	1620	700	650	390	390	266
4	203	178	220	242	350	1840	1620	1090	650	470	350	266
5	200	220	242	242	335	2180	1710	1090	820	410	350	266
6	198	198	242	242	470	2330	1540	950	820	430	390	266
7	198	198	242	242	600	2630	1540	760	650	430	370	292
8	198	198	242	242	650	2880	1620	760	650	430	370	292
9	198	198	220	220	790	3300	1980	880	650	430	370	266
10	198	188	198	242	760	3740	1890	880	650	390	390	266
11	198	198	198	266	675	3850	1890	1230	950	390	390	242
12	198	198	198	266	650	4070	1890	1160	950	430	390	242
13	198	198	198	292	575	4840	1890	1160	700	320	292	242
14	198	198	198	350	530	4840	1620	1160	650	320	292	220
15	198	178	198	320	490	4620	1300	1230	650	320	320	220
16	198	178	198	266	550	4620	1540	1160	650	320	292	220
17	198	188	198	266	790	4840	1380	760	650	350	292	220
18	198	198	198	266	950	4620	1380	650	600	350	266	220
19	198	198	220	266	1020	4070	1300	550	575	350	279	220
20	198	198	242	266	1300	4070	1160	470	550	320	279	220
21	188	198	242	266	1420	4460	1160	470	530	320	266	220
22	188	198	242	266	1380	4840	950	470	470	320	266	220
23	188	220	242	320	1460	3520	950	430	470	320	254	220
24	188	220	266	320	1620	2980	760	430	470	320	247	220
25	188	198	292	320	1800	2780	760	430	490	350	242	220
26	188	198	292	320	1890	2580	700	430	470	370	242	220
27	188	198	320	320	1710	2580	600	430	470	350	220	220
28	188	198	350	350	1670	2530	550	550	450	385	220	220
29	188	......	266	350	1710	2480	510	550	430	320	220	220
30	188	......	242	320	1760	2180	650	650	390	320	242	220
31	188	......	266	......	1670	....	650	820	......	335	......	220
Total..	6068	5490	7310	8446	30535	98770	40710	23600	18745	11290	9176	7389
Mean......	196	196	236	282	985	3290	1310	761	625	364	306	238
Max.........	212	220	350	350	1890	4840	1980	1230	950	470	390	292
Min.........	188	178	198	220	320	1380	510	430	390	320	220	220
Acre-ft.	12100	10900	14500	16800	60600	196000	80600	46800	37200	22400	18200	14600

Unless otherwise noted, all discharges are in cubic feet per second.

ARKANSAS RIVER AT CANON CITY

Location.—Just below Hot Springs Hotel, at the mouth of the canyon, and 1½ miles above Canon City. Nearest important tributary is Grape Creek, which enters above.

Records Available.—May 1, 1888, to December 31, 1918.

Drainage Area.—3,060 square miles.

Gage.—Automatic recording gage established by the State Engineer in September, 1909.

Channel.—The channel shifts to such an extent during high water that at times it is necessary to move the gage in order to read the gage heights.

Discharge Measurements.—Made from car and cable.

Winter Flow.—Ice causes backwater during the winter months.

Diversions.—There are court decrees for diversions of 131 second-feet from the Arkansas between the stations at Canon City and Salida, and diversions of 2,286 second-feet from intervening tributaries.

ARKANSAS RIVER AT PUEBLO

Location.—At Main Street Bridge in Pueblo, 2 miles above the mouth of Fountain Creek, the nearest tributary.

Records Available.—September 19, 1894, to December 31, 1918. From May 1, 1885, to September 30, 1886, a station was maintained at Pueblo by the State Engineer; from June 1, 1887, to September 30, 1887, a station was maintained at a point 9 miles above Pueblo; from May 1, 1889, to August 31, 1889, the United State Geological Survey maintained the station 9 miles above Pueblo.

Drainage Area.—4,600 square miles.

Gage.—An automatic gage located 150 feet below Main Street Bridge has been used since March 22, 1911.

Channel.—Shifting.

Discharge Measurements.—Made from Main Street Bridge.

Winter Flow.—Ice causes some slight backwater during the winter months.

Diversions.—There are court decrees for diversions of 637 second-feet from Arkansas River, between the station at Canon City and Pueblo, and diversions of 372 second-feet from intervening tributaries.

Co-operation.—This station is maintained in co-operation with the Arkansas Valley Ditch Association.

Discharge of Arkansas River at Canon City for 1917.
Drainage Area 3,060 Square Miles. Altitude 5,363 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	550	343	280	435	458	900	3430	1560	736	312	244	320
2	550	343	343	389	527	980	3430	1460	705	308	343	300
3	527	435	343	366	550	860	3110	1260	674	300	352	300
4	527	435	366	320	550	829	2970	1020	643	304	366	292
5	527	458	412	343	550	940	2900	980	612	296	366	280
6	504	435	435	389	458	1020	2760	860	643	288	343	288
7	504	412	366	343	435	1020	2550	980	674	280	320	343
8	504	412	366	366	481	1060	2690	1100	612	292	329	361
9	504	412	366	412	643	1360	3270	1100	481	312	329	329
10	504	458	366	412	674	1830	3590	1100	458	308	329	375
11	504	481	389	412	643	2760	3040	1180	444	312	343	371
12	458	504	389	412	627	2900	2760	1260	426	320	343	375
13	343	458	360	435	481	3040	2550	1260	421	312	338	375
14	300	389	389	481	481	3430	2350	1140	463	296	308	394
15	300	389	343	481	643	3830	2020	980	536	284	338	398
16	300	389	343	458	900	4170	2150	940	527	272	366	384
17	366	366	360	435	1140	4340	2020	829	513	264	343	357
18	435	366	389	366	1310	4510	1960	798	481	252	300	366
19	504	366	412	343	1460	4760	1960	940	375	256	288	389
20	527	389	435	320	1460	4760	2020	860	366	236	312	371
21	435	389	435	300	1410	4340	1890	829	366	224	334	366
22	343	435	435	343	1310	4250	1660	767	375	240	320	361
23	389	435	412	412	1260	4340	1960	674	375	272	312	329
24	458	435	412	412	1220	4250	1890	643	371	272	308	325
25	458	435	389	412	1140	4250	2090	581	366	264	300	329
26	481	412	389	458	980	4250	2150	550	348	272	308	325
27	481	366	389	389	798	3830	1410	527	348	284	320	320
28	435	366	389	366	767	3510	2090	550	329	288	300	320
29	458	......	458	366	705	3590	1890	674	329	312	288	320
30	458	......	527	389	705	3590	1760	736	329	320	288	308
31	458	......	527	......	705	....	1710	736	......	348	......	300
Total	14092	11513	12214	11765	25371	89499	74030	28874	14326	8900	9678	10571
Mean	455	411	394	392	818	2980	2390	931	478	287	323	341
Max	500	504	527	481	1460	4760	3590	1560	736	320	366	398
Min	300	343	280	300	435	829	1410	527	329	224	244	280
Acre-ft.	28000	22800	24200	23300	50300	177000	147000	57200	28400	17100	19200	21000

Discharge of Arkansas River at Canon City for 1918.
Drainage Area 3,060 Square Miles. Altitude 5,363 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	300	550	280	366	320	1560	1890	930	670	435	550	412
2	304	610	300	320	320	1410	1660	860	730	504	458	412
3	308	458	320	280	343	1510	1510	860	700	458	527	412
4	312	610	343	240	343	1710	1510	1010	670	366	670	412
5	316	640	366	260	366	2020	1560	1050	700	458	550	412
6	320	730	389	260	435	2410	1560	1050	700	458	458	412
7	280	527	435	320	610	2690	1310	860	700	369	412	412
8	300	504	435	280	670	2830	1560	790	700	280	412	412
9	320	412	412	320	730	3110	1890	860	640	320	412	412
10	280	366	366	320	790	3590	1820	860	700	320	366	412
11	320	366	343	366	760	4080	1890	1010	700	366	412	412
12	320	366	343	366	730	4420	2020	1170	700	366	458	366
13	366	389	343	389	640	4590	1890	1170	700	389	389	412
14	280	366	343	412	580	4950	1610	1130	670	435	389	366
15	280	366	343	435	550	4950	1560	1090	580	458	412	412
16	240	300	343	366	550	4860	1460	1090	700	435	366	412
17	260	343	320	343	760	4760	1890	1090	730	389	389	458
18	343	366	320	300	970	4950	1760	895	670	458	389	412
19	343	343	343	280	1090	4680	1660	760	504	389	389	412
20	343	300	320	300	1260	4160	1220	790	580	389	412	412
21	366	320	343	300	1460	3910	1010	700	580	481	435	412
22	412	366	343	320	1360	3910	1090	550	412	458	412	412
23	366	412	320	366	1410	4760	1170	550	240	412	435	366
24	435	366	343	366	1610	3590	1010	458	160	366	400	366
25	412	343	435	366	1820	3430	860	389	366	412	366	366
26	280	320	412	366	1890	3110	790	366	120	481	458	320
27	300	320	412	389	1710	2550	790	366	200	412	435	320
28	320	280	412	412	1610	2410	730	366	220	389	435	320
29	366	......	412	343	1660	2080	730	366	343	458	412	320
30	366	......	389	320	1710	1960	700	527	412	504	412	320
31	435	......	366	......	1660	....	860	580	......	481	......	320
Total	10193	11639	11194	10071	30717	100950	42970	24543	16497	12896	12920	11970
Mean	329	416	361	336	991	3360	1390	792	550	416	431	386
Max	435	730	435	435	1890	4950	2020	1170	730	504	670	458
Min	240	280	280	240	320	1410	700	366	120	280	366	300
Acre-ft.	20200	23100	22200	20000	60900	200000	85500	48700	32700	25600	25600	23700

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Arkansas River at Pueblo, Colo., for 1917.
Drainage Area, 4,600 Square Miles. Altitude, 4,675 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	478	340	265	340	315	1185	3016	1687	671	325	401	245
2	478	315	265	315	360	1275	2936	1473	638	305	406	320
3	450	395	240	265	450	1275	2620	1320	612	305	434	305
4	423	395	265	240	423	1095	2326	1131	671	305	406	270
5	450	368	265	240	340	1185	2188	1077	612	280	384	245
6	423	395	240	240	368	1230	2092	1212	632	255	373	235
7	423	368	240	265	368	1185	1936	897	657	235	390	222
8	368	395	217	217	395	1185	1996	946	618	362	346	315
9	368	423	265	240	450	1275	2920	946	472	390	384	320*
10	423	368	265	290	592	1780	4082	960	423	351	295	325
11	450	340	240	340	625	2410	3096	1050	395	330	260	338
12	450	340	240	423	533	2480	2606	1149	340	340	295	338
13	368	368	240	450	450	2550	2354	1248	315	330	305	345
14	265	340	240	450	423	3000	1984	1176	395	320	315	350
15	217	368	240	450	450	3320	1840	987	483	357	280	355*
16	128	395	240	423	533	3570	1780	890	362	325	300	362
17	217	368	217	290	690	4120	1888	996	362	320	384	310
18	395	315	217	217	925	4405	1768	1311	357	315	335	275
19	505	315	265	217	1230	4690	1756	946	260	346	305	275
20	505	315	290	217	1275	4595	1852	960	461	325	280	260
21	450	315	290	172	1140	4405	1828	827	434	315	275	231
22	340	315	315	150	1095	3930	1555	742	423	335	260	235
23	315	315	368	195	1050	3835	1473	625	401	346	280	209
24	340	315	315	315	1005	3835	1828	586	379	270	260	150
25	395	368	290	290	1095	3740	1768	527	320	270	255	141
26	450	423	265	265	1005.	3485	1840	483	395	290	275	164
27	478	315	240	265	855	3320	2550	472	401	290	300	200
28	450	265	217	240	820	3240	1936	516	401	290	325	132
29	423	......	315	265	750	3096	1876	544	357	395	295	128
30	423	......	450	290	750	2952	1912	632	325	411	270	177
31	368	......	368	......	925	......	1924	657	......	373	......	173
Total..	12216	9857	8389	8576	21693	83648	67526	28873	13572	10006	9673	7945
Mean......	394	352	271	286	700	2788	2178	931	452	323	322	256
Max.	505	423	450	450	1275	4690	4082	1687	671	411	434	362
Min.........	128	265	217	150	315	1095	1473	472	261	235	255	128
Acre-ft...	24200	19600	16700	17000	43000	166000	134000	57200	26900	19900	19200	15700

NOTE.—*Dec. 9 to 15 discharges estimated. Ice condition existed.

Discharge of Arkansas River at Pueblo for 1918.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	196	140	190	330	270	1300	1440	270	300	190	270	215
2	218	240	240	270	215	1360	1240	270	240	190	240	270
3	240	215	240	125	240	1370	1090	270	240	190	270	215
4	223	360	190	125	240	1380	1090	480	270	190	240	200
5	206	450	190	125	270	1600	1340	700	550	240	240	200
6	190	420	240	190	390	1760	1440	585	620	270	215	200
7	190	480	190	165	480	2530	1340	480	450	140	240	200
8	190	330	240	165	620	2350	1440	480	330	125	270	190
9	190	215	165	190	550	2420	1340	550	360	125	240	190
10	190	190	100	125	550	2690	1650	450	270	110	240	230
11	190	190	100	165	550	3260	2520	450	420	125	300	200
12	190	165	90	190	660	3520	1760	480	620	110	300	190
13	190	140	90	190	620	4320	1240	450	585	110	300	200
14	330	90	90	300	450	4500	1140	860	480	190	270	230
15	480	64	190	390	420	4320	1140	620	420	190	270	190
16	300	42	190	270	390	3960	950	550	420	165	270	230
17	300	72	215	190	420	4320	1240	550	420	165	215	230
18	420	165	165	125	636	4320	995	420	390	215	240	252
19	480	90	190	100	788	4050	1040	300	360	240	230	230
20	330	90	140	140	852	3600	905	190	360	240	240	200
21	360	190	140	165	1160	3430	905	140	360	240	140	240
22	240	240	190	140	1140	4320	950	125	300	240	165	230
23	300	190	215	190	1180	6380	860	110	270	240	190	215
24	480	165	190	215	1310	3600	860	110	215	215	240	240
25	620	90	240	300	1390	3100	585	100	215	240	252	190
26	480	90	330	300	1490	2660	550	90	215	240	252	150
27	300	56	300	330	1620	2180	480	81	240	270	240	140
28	190	140	215	390	1420	2000	480	49	240	300	240	140
29	300	......	300	360	1380	1760	360	56	190	240	270	140
30	190	......	300	300	1330	1540	420	140	165	240	240	140
31	110	......	215	......	1340	......	360	300	......	240	......	140
Total..	8893	5309	6080	6560	24371	89900	32950	10706	10515	6225	7329	6227
Mean......	287	190	196	219	786	3000	1060	345	350	201	244	201
Max.	620	480	330	390	1620	6380	2520	860	620	270	300	270
Min.........	110	42	90	100	215	1300	360	49	165	110	140	140
Acre-ft...	17600	10600	12100	13000	48300	179000	65200	21200	20800	12400	14500	12400

Unless otherwise noted, all discharges are in cubic feet per second.

ARKANSAS RIVER NEAR NEPESTA

Location.—At the dam of the Oxford Farmers' Canal Co., in Sec. 31, T. 21 S., R. 60 W., 1½ miles above Nepesta; about 6 miles below the mouth of Huerfano River, the nearest important tributary.

Records Available.—September 8, 1897, to October 31, 1903; July 14, 1909, to November 30, 1912; January 1, 1914, to December 31, 1918.

Drainage Area.—9,130 square miles.

Gage.—An automatic recording gage with its zero coinciding with the lowest point of the diversion dam has been in use since 1910. There is no known relation between the present gage and that used in 1903.

Channel.—The diversion dam is the control point, and as the results show shifting conditions it is evident that the dam is not permanent.

Discharge Measurements.—Made from the bridge at Nepesta except during low water, when measurements are made by wading.

Winter Flow.—Ice causes backwater during a portion of the winter months.

Diversions.—There are court decrees for diversions of 1,552 second-feet from the Arkansas between Pueblo and Nepesta, and approximately 1,600 second-feet from intervening tributaries. The discharge records given in this report do not include the flow of the canal.

Accuracy.—Results fair.

Co-operation.—Maintained in co-operation with the Arkansas Valley Ditch Association.

ARKANSAS RIVER AT LA JUNTA

Location.—At the east bridge at La Junta; no important tributary within several miles.

Records Available.—April 11, 1912, to December 31, 1918. From December 5, 1893, to December 31, 1895, a station was maintained near the city pumping plant. During 1899 and 1901 a station was maintained at the head of the Fort Lyon Canal by the Great Plains Water Co. From April 7, 1903, to October 31, 1903, a station was maintained one mile east of La Junta and a number of discharge measurements were made during 1904. From August 27, 1908, to November 30, 1908, a station was maintained half a mile northwest of La Junta, just below the mouth of Crooked Arroyo.

Drainage Area.—12,200 square miles.

Gage.—Automatic recording gage.

Channel.—Shifting.

Discharge Measurements.—Made from the bridge during high water and by wading at ordinary stages.

Winter Flow.—Ice causes backwater during the winter months.

Diversions.—There are court decrees for diversions of 2,735 second-feet from the Arkansas between Nepesta and La Junta, and 511 second-feet from intervening tributaries.

Co-operation.—Station maintained in co-operation with the Arkansas Valley Ditch Association.

Discharge of Arkansas River at Nepesta for 1917.

Drainage Area, 9,130 Square Miles. Altitude, 4,396 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	896	352	352	570	450	990	1950	1130	460	293	344	185
2	896	395	310	378	500	1460	2130	944	267	267	344	198
3	1076	430	310	293	600	1390	2050	896	344	224	335	211
4	1126	470	361	218	656	1190	1800	692	520	230	344	192
5	1126	620	318	218	656	1390	1480	668	395	218	352	237
6	1126	470	318	259	656	1460	1640	570	237	211	420	267
7	812	335	284	301	600	1250	1500	470	259	284	420	141
8	470	327	211	344	560	1190	1450	470	386	301	378	182
9	335	318	244	267	560	1390	1530	460	378	259	344	187
10	335	237	244	310	560	1530	1940	520	198	224	335	261
11	335	205	324	267	670	1810	1800	644	378	198	276	261
12	327	205	293	440	795	1670	1360	692	335	185	267	261
13	369	244	259	440	795	1630	1240	740	318	211	267	271
14	361	327	259	361	730	1970	1230	800	352	192	250	278
15	361	560	259	318	795	2160	800	920	600	172	293	283
16	361	460	224	276	860	2300	860	884	378	205	378	290
17	352	284	224	500	1060	2510	956	920	267	250	378	282
18	395	335	259	460	1120	2630	992	872	250	250	386	247
19	386	378	301	412	1190	2770	980	644	250	237	80	172
20	430	293	352	460	1320	3140	992	560	301	244	80	157
21	430	185	395	460	1530	3220	1080	540	293	267	80	33
22	430	218	395	412	1190	2750	944	470	293	284	80	54
23	420	192	403	378	1120	2150	884	470	231	344	80	100
24	420	430	450	218	990	2360	1150	440	231	327	80	80
25	369	430	361	430	1060	2410	884	412	250	267	335	108
26	369	440	318	430	990	2410	1000	378	590	301	335	108
27	369	395	361	430	1320	2470	1570	369	470	310	335	112
28	369	352	369	430	730	2450	1560	395	318	318	335	192
29	352	......	369	395	670	2350	1390	395	293	420	218	83
30	352	......	378	490	555	2130	1280	361	310	378	293	92
31	352	......	420	......	795	......	1260	668	......	310	......	42
Total	16107	9887	9925	11165	26083	60530	41682	19394	10152	8181	8442	5567
Mean	520	353	320	372	841	2020	1340	626	338	264	281	180
Max.	1126	625	450	578	1530	3220	2130	1130	600	420	420	290
Min.	327	185	211	218	450	990	884	361	198	172	80	33
Acre-ft.	32000	19600	19700	22100	51700	120000	82400	38500	20100	16200	16700	11100

Discharge of Arkansas River at Nepesta for 1918.

Drainage Area, 9,130 Square Miles. Altitude, 4,396 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	340	284	385	322	360	930	1060	520	88	378	292	420
2	270	284	194	430	360	1190	1110	470	120	310	292	378
3	282	284	208	420	350	1070	1220	335	120	292	250	250
4	319	293	312	440	340	1070	1320	440	133	267	250	185
5	340	340	340	304	295	1210	1360	740	218	250	250	185
6	208	350	291	277	268	1420	1390	378	470	218	250	185
7	403	300	298	241	295	1520	1320	860	420	292	250	100
8	340	300	284	268	360	1210	1850	520	310	185	378	100
9	284	300	185	322	430	1720	920	335	520	237	335	60
10	284	320	130	268	440	1940	1460	378	520	250	420	470
11	284	340	167	268	620	1790	3710	335	80	237	420	335
12	284	340	258	295	656	2020	4600	292	620	237	420	310
13	284	305	194	295	560	2240	1420	250	680	120	420	292
14	284	305	208	295	560	2400	860	378	620	133	440	335
15	284	430	185	560	430	2790	980	1230	420	218	420	310
16	284	430	284	440	360	2710	1630	520	520	335	378	292
17	284	408	305	360	340	2550	740	620	590	310	292	292
18	284	385	208	295	390	2950	1360	570	860	310	292	250
19	284	340	176	277	560	2710	740	620	420	420	420	292
20	284	520	185	259	680	2270	860	570	570	420	420	335
21	284	319	130	268	656	3030	800	420	420	378	378	292
22	284	319	136	268	680	2710	1100	352	470	335	378	335
23	284	305	250	295	656	3830	980	335	420	292	420	335
24	284	270	206	370	680	3270	860	318	403	292	420	425
25	284	208	206	410	740	2710	860	218	335	292	420	425
26	284	130	340	440	1000	1940	740	250	378	250	420	335
27	284	146	390	476	608	1830	630	218	378	250	420	335
28	284	162	162	464	1040	1520	520	198	403	185	420	335
29	284	......	250	430	800	1350	520	133	378	420	420	335
30	284	......	340	430	865	1200	378	133	378	420	420	335
31	284	......	410	......	1000	......	335	250	......	420	......	335
Total	9034	8717	7617	10487	17379	61100	37633	13186	12262	8953	11005	9198
Mean	291	311	246	350	561	2040	1210	425	409	289	367	297
Max.	403	520	410	560	1040	3830	4600	1230	860	420	440	470
Min.	208	130	130	241	268	930	335	133	80	120	250	60
Acre-ft.	17900	17300	15100	20800	34500	121000	74400	26100	24300	17800	21800	18300

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Arkansas River at La Junta for 1917.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	82	34	21	38	21	412	705	486	52	63	36	81
2	34	34	21	44	18	465	1020	486	35	24	36	130
3	48	34	21	38	26	624	860	486	34	18	75	180
4	43	29	21	33	21	496	920	184	34	18	192	282
5	50	34	26	28	48	538	880	538	30	8	186	155
6	37	29	26	33	518	486	353	486	30	8	186	40
7	18	29	26	44	638	423	318	381	33	21	246	26
8	18	29	26	38	638	332	528	206	58	36	228	21
9	21	33	26	33	759	402	444	241	44	14	210	81
10	26	28	26	28	507	353	900	241	63	10	210	40
11	26	33	130	33	353	454	826	162	21	44	196	60
12	26	4	152	44	241	346	1020	48	46	44	180	26
13	12	2	130	32	392	325	786	109	44	23	155	270
14	49	4	130	37	538	311	402	121	39	29	90	75
15	49	6	152	162	297	248	624	82	306	29	84	21
16	49	3	130	121	62	465	584	109	126	29	130	10
17	42	6	130	139	325	402	584	139	56	18	204	6
18	36	6	40	162	402	269	283	211	29	37	122	6
19	35	7	40	184	444	346	248	60	87	81	110	6
20	40	7	35	206	444	624	216	206	102	180	165	6
21	35	7	70	157	486	960	283	454	44	270	175	6
22	35	7	40	180	202	638	297	392	106	300	122	18
23	35	7	29	134	584	538	444	283	98	140	90	8
24	43	9	29	118	412	193	528	241	94	196	282	12
25	43	18	8	297	402	423	496	180	81	300	270	21
26	43	18	10	9	496	772	496	50	94	222	228	8
27	43	18	13	12	732	692	549	62	126	240	246	18
28	30	18	29	15	486	570	496	36	60	234	240	34
29	34	......	10	26	370	597	444	33	75	94	180	150
30	29	......	13	36	570	746	454	34	135	44	140	90
31	34	......	13	......	412	......	496	32	......	29	......	40
Total..	1145	493	1573	2461	11844	14450	16860	6779	2182	2803	5114	1927
Mean......	37	17.6	50.7	82	382	482	544	219	72.7	90.4	170	62.2
Max.	82	34	152	297	759	960	1020	538	306	300	282	282
Min.........	12	2	8	9	18	193	216	32	21	8	36	6
Acre-ft...	2280	978	3120	4880	23500	28700	33400	13500	4330	5560	10100	3820

Discharge of Arkansas River at La Junta for 1918.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	16	12	10	122	110	210	170	180	18	180	300	210
2	16	16	12	122	84	351	192	40	40	110	300	140
3	16	16	14	98	90	428	492	40	16	60	300	90
4	12	18	16	186	122	524	479	40	13	75	332	110
5	7	21	16	170	151	556	492	90	21	75	351	94
6	10	26	12	155	180	556	466	66	40	84	332	80
7	14	33	12	140	160	492	505	90	72	40	351	66
8	14	26	33	150	110	607	588	122	110	33	364	98
9	14	26	50	78	60	466	155	210	122	29	351	72
10	14	26	110	40	90	569	270	300	396	26	332	58
11	14	16	240	54	160	460	620	155	240	40	332	44
12	15	16	33	56	110	364	812	50	60	44	351	63
13	15	16	21	30	135	396	155	40	44	34	396	58
14	15	16	16	33	60	492	364	60	75	32	428	37
15	15	16	16	52	44	524	288	170	110	29	441	39
16	16	16	12	155	155	569	240	332	66	50	441	37
17	16	16	33	90	155	735	114	60	98	60	396	40
18	16	21	50	75	130	876	332	26	106	140	364	34
19	16	26	60	69	102	844	252	26	130	90	326	56
20	16	21	110	74	75	812	40	210	130	155	210	84
21	16	21	75	79	155	876	122	29	170	270	140	72
22	16	26	110	84	288	812	60	26	180	300	192	56
23	16	26	60	60	390	876	60	40	155	264	122	40
24	16	24	75	56	332	812	90	16	130	338	130	18
25	16	7	90	75	270	396	228	40	130	313	56	16
26	16	8	110	106	270	492	240	90	192	326	192	16
27	8	8	155	98	562	492	313	54	300	300	210	29
28	8	8	130	122	620	524	351	18	300	351	130	33
29	8	......	180	110	569	415	332	18	276	300	210	34
30	10	......	60	90	530	240	228	12	264	300	210	33
31	16	......	130	......	300	......	300	13	......	300	......	33
Total..	433	528	2050	2829	6569	16766	9350	2663	4004	4748	8590	1890
Mean......	14.0	18.9	66.1	94.3	212	559	302	85.9	133	153	286	61.0
Max.	16	33	240	186	620	876	812	332	396	338	441	210
Min.........	7	7	10	30	60	210	40	12	13	26	56	16
Acre-ft...	861	1050	4060	5610	13000	33300	18600	5280	7910	9410	17000	3750

Unless otherwise noted, all discharges are in cubic feet per second.

ARKANSAS RIVER AT LAMAR

Location.—Located at highway bridge, one mile north of Lamar.

Records Available.—May 11, 1913, to December 31, 1918.

Gage.—Bristol automatic gage and standard chain gage.

Channel.—Shifting.

Diversions.—With the exception of a few small ditches, below all diversions on the river.

Accuracy.—Results are considered fair.

Co-operation.—Maintained in co-operation with the Arkansas Valley Ditch Association.

ARKANSAS RIVER AT HOLLY

Location.—At highway bridge half a mile southeast of Holly, on line between Secs. 14 and 15, T. 23 S., R. 42 W., 1 mile below the mouth of Wild Horse Creek, an intermittent stream.

Records Available.—October 15, 1907, to December 31, 1918.

Drainage Area.—Approximately 25,000 square miles.

Gage.—A number of gages have been used at the station, but all readings have been referred to the same datum except those from October 25 to December 31, 1911, when a different datum was used.

Channel.—Very shifting.

Discharge Measurements.—Made from bridge during high water and by wading at low stages.

Winter Flow.—Ice causes backwater during a portion of the winter months.

Diversions.—There are court decrees for diversions of 1,072 second-feet from Arkansas River between the stations at La Junta and Holly, and diversions of 1,253 second-feet from intervening tributaries. There are many diversions from Arkansas River below Holly, in Kansas.

Co-operation.—Station maintained in co-operation with the Arkansas Valley Ditch Association.

Discharge of Arkansas River at Lamar for 1917.

Drainage Area .... Square Miles. Altitude 3,610 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	184	74	8	2	3	8	8	2	2	8	8	4
2	184	104	6	1	4	6	8	2	2	12	6	4
3	184	134	12	1	3	8	15	2	2	4	6	4
4	227	164	12	1	3	6	152	2	2	4	6	4
5	326	194	12	3	8	45	520	3	2	4	4	4
6	227	224	6	3	2	26	15	2	2	4	4	4
7	184	227	24	1	3	8	8	2	2	4	4	4
8	227	270	26	1	4	36	8	2	2	3	4	26
9	227	326	12	1	6	2	6	2	2	3	4	26
10	326	382	8	1	4	2	4	2	15	4	4	74
11	270	184	8	3	4	1	15	2	8	4	4	97
12	270	120	6	1	4	3	97	2	3	4	4	97
13	184	60	6	2	4	4	20	2	2	4	4	97
14	97	36	6	1	4	4	6	8	8	4	4	97
15	184	36	4	1	8	4	4	12	12	4	4	97
16	326	20	6	1	4	4	4	12	74	4	4	26
17	451	26	6	1	2	4	4	1	36	4	4	184
18	608	45	8	3	3	6	97	2	8	4	4	74
19	910	45	8	36	4	12	12	2	8	4	4	97
20	910	26	8	6	2	8	15	2	3	4	4	97
21	696	8	8	6	3	152	12	8	4	3	4	97
22	608	8	8	3	3	451	12	3	3	4	4	97
23	608	8	4	3	3	227	4	2	3	3	4	97
24	520	6	4	4	4	20	4	2	4	6	4	97
25	608	4	2	3	2	20	3	2	3	4	4	97
26	451	4	3	3	3	20	3	2	102	4	4	97
27	326	4	3	3	2	15	3	2	184	4	4	97
28	184	4	2	3	326	12	3	2	15	4	4	97
29	97	......	3	3	608	12	2	2	8	382	4	97
30	152	......	2	3	4	15	2	2	8	74	4	97
31	60	......	1	......	8	......	2	2	......	8	......	97
Total..	10816	2743	282	104	1045	1141	1068	95	529	586	130	2184
Mean......	349	98	9.1	3.5	33.7	38.0	34.5	3.06	17.6	18.9	4.25	70.5
Max........	910	382	74	36	608	451	520	12	184	382	8	184
Min.........	60	4	1	1	2	1	2	1	2	3	4	4
Acre-ft.	21500	5440	560	208	2070	2260	2120	188	1050	1160	253	4330

Discharge of Arkansas River at Lamar for 1918.

Drainage Area .... Square Miles. Altitude 3,610 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	81	127	226	15	15	52	6	12	9	6	6	75
2	95	127	149	15	15	12	9	12	9	6	6	75
3	95	127	149	15	15	15	9	12	9	6	6	75
4	72	127	132	15	15	14	4	12	12	6	12	75
5	49	127	52	64	15	13	12	12	12	6	12	75
6	49	206	52	44	15	12	6	25	25	6	12	75
7	34	206	30	12	15	10	12	12	25	4	6	75
8	58	206	24	15	15	8	4	12	38	4	6	75
9	58	286	15	12	15	9	188	12	12	4	6	25
10	62	226	15	12	15	11	12	12	25	4	6	25
11	72	206	15	12	15	12	73	12	496	4	6	25
12	77	132	15	12	15	12	55	9	602	4	6	25
13	99	206	15	12	15	11	368	9	188	4	6	55
14	99	166	15	12	15	11	92	9	55	4	6	38
15	99	132	15	89	15	12	38	9	55	4	6	38
16	99	149	15	30	15	12	203	12	25	4	6	38
17	108	132	15	132	12	15	38	12	12	3	6	38
18	108	117	15	24	12	12	25	9	12	3	55	92
19	80	117	15	24	12	89	64	9	25	3	55	155
20	80	132	15	20	12	36	64	9	12	3	55	155
21	127	132	15	20	12	36	25	9	12	3	12	155
22	127	132	15	20	12	250	513	9	12	6	3	155
23	127	149	15	20	12	248	188	9	12	3	3	155
24	127	149	15	20	12	246	25	9	9	6	6	75
25	127	24	15	20	12	401	25	566	9	6	6	75
26	127	8	15	20	12	186	25	38	9	6	6	75
27	127	44	15	20	12	286	12	25	6	6	6	75
28	127	149	15	20	12	166	12	12	6	6	6	75
29	127	......	15	20	12	89	9	12	6	6	6	75
30	127	......	15	20	15	12	73	9	6	6	6	75
31	127	......	15	......	206	......	12	9	......	6	......	75
Total..	2971	4041	1159	786	617	2298	2201	939	1745	148	345	2374
Mean......	95.8	144	37.4	26.2	19.9	76.6	71.0	30.3	58.2	4.71	11.5	76.5
Max........	127	286	226	132	15	401	513	566	602	6	55	155
Min.........	34	8	15	12	12	8	4	9	6	3	3	25
Acre-ft.	5890	8000	2300	1560	1220	4560	4370	1860	3460	290	684	4700

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Arkansas River at Holly for 1917.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	219	158	148	52	......	......	12	11	44	113	60	7
2	219	133	148	52	......	......	12	12	44	108	51	6
3	219	208	122	51	......	......	12	12	46	110	51	6
4	219	153	120	49	......	......	12	12	41	117	49	6
5	219	178	120	49	......	......	31	14	38	117	49	5
6	219	205	120	47	......	......	205	15	38	84	41	6
7	244	202	117	......	......	......	106	15	40	54	41	4
8	188	200	141	......	......	56	56	13	40	54	34	4
9	242	197	93	......	......	58	56	12	40	54	34	30
10	242	197	93	......	......	60	31	11	41	52	27	47
11	242	225	93	......	73	61	106	93	41	36	21	56
12	183	222	90	......	73	63	56	172	42	16	21	80
13	180	222	113	......	71	19	63	65	35	11	13	113
14	84	191	110	......	51	19	63	585	42	14	13	168
15	84	165	86	......	51	19	26	136	44	14	12	191
16	177	219	86	......	51	19	32	136	44	14	12	178
17	175	162	106	......	51	19	32	106	104	24	12	170
18	342	188	84	......	13	19	32	88	108	30	10	170
19	403	186	82	......	13	19	32	80	88	30	12	129
20	371	186	82	......	13	19	34	82	63	24	12	104
21	371	113	82	......	......	19	34	76	82	24	13	93
22	400	110	80	......	......	19	34	65	78	36	15	93
23	400	108	80	......	......	19	22	65	78	35	15	82
24	397	129	78	......	......	84	14	60	80	42	15	61
25	397	153	78	......	......	106	12	56	78	42	14	42
26	365	150	78	......	......	56	14	58	93	42	14	51
27	426	126	97	......	......	31	11	51	205	35	17	82
28	422	124	76	......	......	19	11	47	219	35	7	28
29	387	......	73	......	......	19	10	42	165	30	7	34
30	158	......	54	......	......	19	11	44	117	30	7	21
31	155	......	52	......	......	......	14	44	......	60	......	21
Total..	8349	4810	2982	300	460	841	1196	2278	2218	1487	699	2088
Mean......	269	172	96.2	50.0	46.0	36.6	38.6	73.5	73.9	48.0	23.3	67.4
Max........	426	225	148	......	......	......	205	585	219	117	60	191
Min.........	84	108	52	......	......	......	10	11	35	11	7	4
Acre-ft.	16500	9550	5920	595	912	1670	2370	4520	4400	2950	1390	4140

Discharge of Arkansas River at Holly for 1918.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	21	60	141	42	19	333	101	49	17	47	86	131
2	133	60	150	28	19	194	61	32	17	47	86	131
3	131	60	126	28	19	54	61	32	17	47	86	131
4	131	60	150	42	19	56	46	32	40	47	86	131
5	108	60	202	60	19	56	46	32	56	47	86	139
6	108	60	175	60	19	56	46	32	56	47	86	147
7	65	60	150	60	20	58	46	32	56	32	86	155
8	63	60	126	60	20	58	47	32	55	32	86	163
9	63	60	124	60	20	27	47	32	55	32	86	171
10	63	60	101	18	20	28	47	32	54	32	86	180
11	19	60	60	18	20	28	108	32	54	32	86	180
12	18	60	60	18	20	30	76	32	397	32	86	168
13	100	60	60	28	20	30	480	31	394	32	86	155
14	100	60	80	42	21	31	387	31	216	40	86	131
15	100	60	101	42	21	31	211	31	177	47	65	131
16	100	50	80	42	13	20	275	19	138	47	65	108
17	100	60	60	60	13	8	339	19	136	47	65	108
18	100	60	60	61	13	8	110	18	136	47	65	108
19	172	60	60	31	13	8	78	18	133	47	65	108
20	172	60	42	18	1	8	99	18	110	47	65	108
21	150	60	42	18	1	22	183	18	88	47	65	155
22	150	131	60	18	1	14	183	18	110	47	65	155
23	150	208	11	18	1	120	239	18	97	47	86	155
24	100	208	60	18	22	225	170	18	86	47	108	155
25	150	153	11	18	22	464	110	101	86	47	108	155
26	150	84	11	18	24	306	110	256	86	56	108	155
27	150	129	7	18	24	183	88	124	86	60	108	155
28	150	129	7	31	24	166	67	51	86	65	108	155
29	60	......	28	19	24	148	58	41	86	65	131	125
30	60	......	51	19	25	124	54	41	65	65	131	125
31	60	......	60	......	333	......	49	17	......	86	......	125
Total..	3197	2292	2456	1013	850	2894	4022	1289	3190	1460	2612	4399
Mean......	103	81.9	79.2	33.8	27.4	96.5	130	41.6	106	47.1	87.1	142
Max........	172	208	202	60	333	464	480	256	397	86	131	180
Min.........	18	50	7	18	1	8	46	17	17	32	65	108
Acre-ft..	6330	4550	4870	2010	1680	5740	7990	2560	6310	2900	5180	8730

Unless otherwise noted, all discharges are in cubic feet per second.

COTTONWOOD CREEK BELOW HOT SPRINGS, NEAR BUENA VISTA

Location.—In the Leadville National Forest, at bridge in Sec. 22, T. 14 S., R. 79 W., half a mile below Hot Springs Hotel and 6 miles west of Buena Vista; 2 miles below mouth of South Fork, the nearest tributary.

Records Available.—April 7, 1911, to November 30, 1918. From September 23, 1910, to September 13, 1911, a station was maintained in section 21, 1 mile above the present station.

Drainage Area.—72 square miles.

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge Measurements.—Made from bridge or by wading.

Winter Flow.—The river is open during the winter months on account of hot springs above.

Diversions.—There are court decrees for diversions of 148 second-feet from Cotton wood Creek, of which 28 second-feet are above the station.

Accuracy.—Records good.

Co-operation.—Station maintained by the United States Geological Survey in co-operation with the United States Forest Service. Records furnished by the United States Geological Survey.

CHALK CREEK AT UPPER STATION NEAR ST. ELMO

Location.—In Sec. 27, T. 15 S., R. 80 W., in the Leadville National Forest, one-quarter mile below the power plant of the Tin Cup Gold Dredging Company, and one and one-quarter miles below St. Elmo. The nearest tributary is Coal Creek, which enters a quarter mile below.

Records Available.—November 15, 1913, to November 22, 1918.

Drainage Area.—48 square miles (measured from Forest atlas).

Gage.—Friez recording gage owned by the Tin Cup Gold Dredging Company.

Channel.—Apparently permanent.

Discharge Measurements.—Made from foot bridge and by wading.

Winter Flow.—Affected very little by ice.

Diversions.—There are no court decrees for diversions from Chalk Creek, the water of which is not returned to the stream above the station.

Regulated Flow.—Low-water flow regulated to a certain extent by a small reservoir at St. Elmo formed by the diversion dam for the Tin Cup Gold Dredging power house.

Accuracy.—Conditions are favorable for accurate results and the estimates are considered excellent.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of Cottonwood Creek Below Hot Springs, near Buena Vista for 1917.
Drainage Area 72 Square Miles. Altitude, 8,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec
1	28	25	22	20	25	36	283	126	46	37	26	25
2	27	25	22	20	24	33	304	118	45	39	28	26
3	27	25	22	20	23	36	283	114	45	39	28	25
4	27	25	22	22	24	50	263	109	44	35	30	22
5	27	25	23	21	23	59	243	109	44	33	30	32
6	27	25	22	22	24	52	236	103	45	33	31	25
7	27	24	23	19	24	52	228	103	48	33	32	22
8	27	24	24	21	24	64	228	92	46	32	27	22
9	27	24	24	22	22	109	236	89	45	32	26	25
10	27	24	22	22	23	166	263	83	44	32	25	25
11	27	24	22	21	22	206	228	103	43	32	25	24
12	27	24	23	21	25	217	192	83	46	33	26	24
13	27	24	23	21	30	283	182	92	43	35	27	24
14	26	24	22	21	32	304	172	92	48	32	26	24
15	26	22	22	21	44	304	172	89	45	32	28	25
16	27	23	21	21	50	348	172	83	44	31	26	24
17	27	24	22	20	59	348	160	83	44	30	25	24
18	27	24	21	20	64	442	150	75	42	26	24	24
19	27	22	22	20	72	394	143	75	41	25	24	24
20	27	23	22	20	64	325	152	75	40	32	26	24
21	27	24	22	20	48	325	138	64	42	31	26	23
22	26	24	22	22	40	325	133	59	40	29	26	22
23	26	24	22	26	40	325	138	56	40	31	26	23
24	26	24	21	28	38	348	138	56	40	29	25	23
25	27	23	22	29	37	370	182	56	40	28	26	22
26	27	23	19	30	36	370	217	50	39	29	26	22
27	27	24	20	26	35	370	172	52	39	26	22	22
28	26	22	22	24	35	370	152	59	39	28	24	22
29	26	......	24	24	34	348	143	56	39	22	25	22
30	25	......	22	24	32	325	133	52	39	28	26	22
31	25	......	22	......	32	......	133	48	......	27	......	22
Total	827	668	684	668	1105	7304	5971	2504	1285	961	792	735
Mean	26.7	23.9	22.1	22.3	35.6	243	193	80.8	42.8	31.0	26.4	23.7
Max	28	25	24	30	72	442	304	126	48	39	32	32
Min	25	22	19	19	22	33	133	48	39	22	22	22
Acre-ft.	1640	1330	1360	1330	2190	14500	11900	4970	2550	1910	1570	1460

Discharge of Cottonwood Creek Below Hot Springs, near Buena Vista for 1918.
Drainage Area 72 Square Miles. Altitude, 8,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	24	20	18	20	22	92	134	41	30	37	30	......
2	24	21	18	19	26	87	129	39	32	34	29	......
3	24	21	19	18	26	143	122	39	32	34	29	......
4	24	20	19	19	33	172	110	39	35	33	29	......
5	24	21	19	18	35	236	106	39	41	33	29	......
6	22	21	19	17	44	263	106	39	49	33	29	......
7	22	20	20	17	50	283	122	41	41	34	29	......
8	22	20	20	18	50	348	106	38	40	34	25	......
9	23	18	16	18	50	417	100	35	44	33	29	......
10	22	19	18	19	50	442	100	39	81	34	29	......
11	21	20	19	19	38	442	93	50	86	34	29	......
12	20	18	19	19	35	417	89	50	70	33	29	......
13	23	19	20	20	35	417	89	54	60	32	29	......
14	23	19	18	20	47	370	81	58	58	32	27	......
15	23	19	18	20	54	370	89	44	54	30	27	......
16	23	19	18	19	71	325	86	38	53	30	24	......
17	23	20	16	19	78	317	76	35	50	30	24	......
18	23	19	17	19	82	287	70	30	48	35	24	......
19	23	19	18	17	82	267	66	30	44	35	24	......
20	23	19	18	17	107	251	66	30	43	32	24	......
21	23	19	19	17	82	224	66	34	41	32	24	......
22	22	20	18	18	82	255	60	34	41	32	24	......
23	21	20	18	18	107	228	60	30	43	30	24	......
24	21	19	18	19	123	228	63	30	44	30	26	......
25	22	20	18	20	130	207	73	30	44	30	24	......
26	22	19	18	24	107	192	58	29	48	29	24	......
27	21	19	19	23	118	162	53	29	43	26	24	......
28	21	18	18	19	130	140	50	28	39	29	24	......
29	21	......	19	19	123	134	47	27	38	30	24	......
30	21	......	19	20	118	134	44	27	37	29	24	......
31	21	......	19	......	100	......	41	27	......	29	......	......
Total	692	546	570	569	2235	7850	2555	1133	1409	988	790	......
Mean	22.3	19.5	18.4	19.0	72.1	262	82.4	36.5	47.0	3[illegible].9	26.3	......
Max	24	21	20	24	130	442	134	58	86	37	30	......
Min	20	18	16	17	22	87	41	27	30	26	24	......
Acre-ft.	1370	1080	1130	1130	4430	15600	5070	2240	2800	1960	1560	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Chalk Creek (Upper Station) at St. Elmo for 1917.
Drainage Area 48 Square Miles. Altitude, 10,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11	11	9	10	23	90	296	104	27	20	17	16
2	11	10	9	11	23	86	260	86	28	20	16	16
3	11	10	9	12	24	124	245	81	26	20	16	16
4	11	10	10	28	26	165	227	79	25	19	17	16
5	11	10	10	31	22	162	218	81	23	18	17	16
6	11	10	10	18	26	143	218	72	26	18	18	16
7	11	10	10	22	22	180	212	64	26	19	16	16
8	11	10	10	16	19	228	239	53	25	18	16	15
9	12	10	10	16	22	309	272	48	23	18	17	......
10	12	10	10	12	23	366	236	58	22	18	16	......
11	12	10	10	12	27	330	197	65	23	18	16	......
12	10	10	10	14	26	339	176	81	23	18	16	......
13	9	10	9	14	36	387	155	75	22	17	16	......
14	9	10	9	16	68	426	145	64	23	17	16	......
15	10	10	9	13	103	432	130	52	22	17	16	......
16	10	10	10	12	134	431	120	50	21	17	16	......
17	10	10	10	12	155	419	108	49	21	17	16	......
18	10	10	10	12	168	416	104	48	20	16	15	......
19	11	10	10	12	138	395	116	45	20	16	16	......
20	12	10	9	16	101	371	106	40	20	17	15	......
21	12	9	9	19	86	353	98	37	20	18	16	......
22	12	9	9	23	77	365	98	34	20	18	15	......
23	12	9	9	31	79	365	118	33	20	17	15	......
24	12	9	9	44	97	365	150	31	20	17	15	......
25	12	9	9	50	93	359	188	29	19	17	15	......
26	12	9	9	46	77	338	275	27	20	17	15	......
27	12	9	10	35	70	320	197	29	20	18	15	......
28	13	9	10	30	77	308	167	31	19	16	16	......
29	12	......	23	27	82	323	152	28	19	16	15	......
30	12	......	12	27	84	320	140	27	19	17	15	......
31	12	......	10	......	86	......	130	26	......	17	......	......
Total..	348	273	312	641	2094	9215	5493	1627	662	546	476	127
Mean......	11.2	9.75	10.1	21.4	67.5	307	177	52.5	22.1	17.6	15.9	15.9
Max........	13	11	23	50	168	432	296	104	28	20	18	16
Min.........	9	9	9	10	19	86	98	26	19	16	15	15
Acre-ft.	689	541	621	1270	4150	18300	10900	3230	1320	1080	946	252

Discharge of Chalk Creek (Upper Station) Near St. Elmo for 1918.
Drainage Area, 48 Square Miles. Altitude, 10,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	26	140	104	29	25	27	20	......
2	......	......	......	......	27	170	98	29	24	26	22	......
3	......	......	......	......	35	245	96	29	25	26	21	......
4	......	......	......	......	48	281	94	32	29	25	21	......
5	......	......	......	......	60	320	90	29	34	24	20	......
6	......	......	......	......	77	350	90	29	38	24	20	......
7	......	......	......	......	82	359	113	30	33	23	20	......
8	......	......	......	......	77	341	108	26	28	23	21	......
9	......	......	......	16	77	374	100	26	37	26	21	......
10	......	......	......	15	70	413	90	28	75	26	19	......
11	......	......	......	15	56	410	86	29	72	26	19	......
12	......	......	......	16	53	419	77	26	58	24	18	......
13	......	......	......	16	66	395	77	29	53	23	18	......
14	......	......	......	16	98	320	72	37	52	22	18	......
15	......	......	......	16	128	335	73	34	49	22	18	......
16	......	......	......	16	158	350	84	28	44	22	19	......
17	......	......	......	17	164	311	75	26	40	24	20	......
18	......	......	......	17	150	269	64	25	38	25	18	......
19	......	......	......	17	200	251	60	23	37	25	18	......
20	......	......	......	18	185	242	65	25	35	25	18	......
21	......	......	......	19	145	260	56	46	34	25	18	......
22	......	......	......	16	155	317	62	32	33	24	17	......
23	......	......	......	17	215	263	79	29	35	24	18	......
24	......	......	......	17	251	239	70	26	40	23	......	......
25	......	......	......	19	236	212	77	26	39	25	......	......
26	......	......	......	20	209	188	56	26	39	22	......	......
27	......	......	......	19	212	167	45	25	35	24	......	......
28	......	......	......	21	230	145	35	26	32	22	......	......
29	......	......	......	21	245	130	34	27	29	22	......	......
30	......	......	......	24	206	116	32	24	28	21	......	......
31	......	......	......	......	158	......	31	23	......	21	......	......
Total..	......	......	......	388	4099	8332	2293	879	1170	741	442	......
Mean......	......	......	......	17.6	132	278	74.0	28.4	39.0	23.9	19.2	......
Max.	......	......	......	24	251	419	113	46	75	27	22	......
Min.........	......	......	..	15	26	116	31	23	24	21	17	......
Acre-ft...	......	......	......	768	8120	16500	4550	1750	2320	1470	876	......

Unless otherwise noted, all discharges are in cubic feet per second.

SOUTH FORK OF ARKANSAS RIVER AT PONCHA

Location.—At highway bridge about half a mile from Poncha, in Sec. 10, T. 49 N., R. 8 E. Nearest tributary, Poncha Creek, enters one-fourth mile below.

Records Available.—January 14, 1911, to April 30, 1918.

Drainage Area.—140 square miles.

Gage.—Vertical staff.

Channel.—Slightly shifting.

Discharge Measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter Flow.—Springs keep this stream open during the winter months.

Diversions.—There are court decrees for diversions of 114 second-feet from the South Fork above the station, and 77 second-feet below. There are also decrees for diversions of 85 second-feet from the North Fork which enters above.

Accuracy.—Results good.

Co-operation.—Records furnished by the United States Geological Survey.

PONCHA CREEK AT PONCHA

Location.—At highway bridge in Sec. 10, T. 49 N., R. 8 E., near Poncha, about one-fourth mile above the mouth of creek.

Records Available.—January 14, 1911, to April 30, 1918.

Drainage Area.—89 square miles.

Gage.—Vertical staff.

Channel.—Slightly shifting.

Discharge Measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter Flow.—Springs prevent the creek from freezing to any considerable extent.

Diversions.—There are court decrees for diversions of 7 second-feet above the station, but none below.

Accuracy.—Results good.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of South Fork Arkansas River at Poncha for 1917.

Drainage Area, 140 Square Miles. Altitude, 7,471 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	39	32	37	24	14	5	117	50	11	4.5	18	44
2	36	33	36	23	8	6	110	43	16	3.4	20	36
3	36	34	34	22	6	5	102	33	14	3.4	18	47
4	36	30	32	20	4	10	88	32	12	3.4	15	47
5	35	30	34	12	3	28	82	26	12	3.0	12	43
6	35	25	29	10	2	14	76	22	12	3.8	13	42
7	39	29	39	10	3	36	82	14	13	3.2	14	44
8	37	31	26	10	3	48	82	13	10	3.2	11	42
9	36	32	32	8	3	130	82	13	8	2.6	15	43
10	36	33	29	9	3	212	88	31	9	2.8	11	43
11	42	33	29	7	3	202	88	36	10	2.4	16	43
12	37	31	26	6	3	204	76	39	11	2.8	10	39
13	37	29	25	5	3	194	65	31	11	3.4	12	39
14	37	22	27	5	3	298	65	27	11	3.4	15	39
15	37	28	26	5	8	348	65	24	10	3.4	25	47
16	37	29	31	4	18	324	60	24	11	5.9	24	44
17	39	29	31	4	43	324	50	26	60	7.0	21	35
18	37	29	31	4	58	327	45	29	61	3.4	21	44
19	40	36	25	4	48	399	55	26	12	3.2	25	39
20	33	35	22	3	32	327	45	26	12	6.3	27	44
21	22	31	24	2	20	260	43	21	12	12	23	46
22	25	29	20	2	11	240	41	27	12	9	23	44
23	28	29	21	4	9	260	55	29	8	8	23	46
24	31	36	24	2	7	242	95	25	6	7	20	50
25	34	29	23	2	6	222	124	20	5	8	20	46
26	33	29	21	2	5	194	157	48	6	6.3	15	44
27	32	30	22	2	8	175	124	15	6	9	16	38
28	32	36	27	2	10	184	76	18	6	11	17	42
29	31	......	28	4	10	148	70	17	5	8	21	38
30	31	......	23	8	7	132	70	18	4	20	43	39
31	31	......	22	......	3	......	70	17	......	18	......	43
Total..	1071	859	856	225	364	5498	2448	820	396	190.8	564	1320
Mean......	34.5	30.7	27.6	7.50	11.7	183	79.0	26.5	13.2	6.15	18.8	42.6
Max.	42	36	37	24	58	399	157	50	61	20	43	50
Min.........	22	22	20	2	2	5	41	13	4	2.4	10	35
Acre-ft...	2120	1700	1700	446	719	10900	4860	1630	786	378	1120	2620

Discharge of South Fork of Arkansas River at Poncha for 1918.

Drainage Area, 140 Square Miles. Altitude, 7,471 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	43	28	32	7	......	......	......	......	......	......	......	......
2	42	39	33	7	......	......	......	......	......	......	......	......
3	44	38	36	8	......	......	......	......	......	......	......	......
4	34	37	31	6.3	......	......	......	......	......	......	......	......
5	36	37	33	6.6	......	......	......	......	......	......	......	......
6	33	30	37	5.2	......	......	......	......	......	......	......	......
7	34	41	34	9	......	......	......	......	......	......	......	......
8	44	33	33	4.5	......	......	......	......	......	......	......	......
9	37	34	28	4.1	......	......	......	......	......	......	......	......
10	35	37	31	4.5	......	......	......	......	......	......	......	......
11	33	35	32	3.8	......	......	......	......	......	......	......	......
12	36	38	34	3.4	......	......	......	......	......	......	......	......
13	36	33	35	3.8	......	......	......	......	......	......	......	......
14	30	30	33	3.4	......	......	......	......	......	......	......	......
15	32	33	30	3.8	......	......	......	......	......	......	......	......
16	30	38	28	1.4	......	......	......	......	......	......	......	......
17	30	27	27	2.2	......	......	......	......	......	......	......	......
18	36	27	25	2.4	......	......	......	......	......	......	......	......
19	34	31	11	1.8	......	......	......	......	......	......	......	......
20	34	38	17	2.6	......	......	......	......	......	......	......	......
21	30	37	12	1.8	......	......	......	......	......	......	......	......
22	30	36	11	1.3	......	......	......	......	......	......	......	......
23	30	38	11	1.4	......	......	......	......	......	......	......	......
24	34	34	15	1.3	......	......	......	......	......	......	......	......
25	37	33	11	1.4	......	......	......	......	......	......	......	......
26	39	31	13	1.3	......	......	......	......	......	......	......	......
27	37	34	15	1.4	......	......	......	......	......	......	......	......
28	34	41	10	1.4	......	......	......	......	......	......	......	......
29	36	......	9	1.4	......	......	......	......	......	......	......	......
30	35	......	8	3.4	......	......	......	......	......	......	......	......
31	34	......	10	......	......	......	......	......	......	......	......	......
Total..	1089	968	725	106.9	......	......	......	......	......	......	......	......
Mean......	35.1	34.6	23.4	3.56	......	......	......	......	......	......	......	......
Max.	44	41	37	9	......	......	......	......	......	......	......	......
Min.......	30	27	8	1.3	......	......	......	......	......	......	......	......
Acre-ft...	2160	1920	1440	212	......	......	......	......	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Poncha Creek at Poncha for 1917.

Drainage Area, 89 Square Miles. Altitude, 7,471 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10	9	6	11	20	48	50	23	6	10	6	10
2	9	9	7	11	22	36	44	20	7	12	6	10
3	9	9	7	9	20	40	45	19	7	12	5	12
4	8	9	8	9	23	80	40	17	7	11	4	12
5	9	9	9	8	20	76	33	16	6	8	3	8
6	9	8	8	8	18	65	34	14	6	8	3	5
7	9	8	9	9	18	82	34	12	6	8	9	6
8	10	8	8	10	20	120	38	11	6	8	5	5
9	9	8	8	10	20	131	38	11	6	7	6	5
10	9	8	8	14	20	154	40	13	6	7	6	5
11	8	9	8	11	18	142	36	12	6	6	4	6
12	8	9	8	9	18	142	31	13	7	6	4	7
13	10	8	10	15	18	142	26	13	6	6	5	6
14	10	8	10	15	18	166	25	14	7	6	8	6
15	12	8	7	17	35	192	23	13	6	5	9	10
16	12	8	10	20	52	120	21	12	7	6	6	8
17	9	8	10	21	83	120	20	13	6	6	6	9
18	8	7	9	21	110	95	22	13	6	2	6	12
19	9	8	9	19	110	131	23	12	8	4	7	11
20	9	8	10	19	92	120	20	11	7	6	8	14
21	8	8	8	19	50	92	20	10	7	7	10	14
22	8	8	10	20	68	88	16	9	8	6	9	11
23	8	8	11	30	55	88	16	9	9	6	5	12
24	8	11	11	30	55	74	24	8	9	5	8	10
25	8	9	8	31	50	80	33	8	9	5	7	12
26	8	9	11	33	47	68	35	7	9	4	10	10
27	8	9	7	30	40	64	27	8	10	4	11	10
28	8	6	12	24	40	36	25	7	10	5	11	12
29	8	......	16	22	40	30	23	7	9	4	11	12
30	8	......	10	20	40	47	23	7	8	5	10	12
31	9	......	4	......	38	......	26	6	......	6	......	8
Total	275	234	277	525	1278	2869	911	368	217	201	208	290
Mean	8.87	8.36	8.94	17.5	41.2	95.6	29.4	11.9	7.23	6.5	6.9	9.4
Max.	12	11	16	33	110	192	50	23	10	12	11	14
Min.	8	6	4	8	18	30	16	6	6	2	3	5
Acre-ft.	545	464	550	1040	2530	5690	1810	732	430	400	411	578

Discharge of Poncha Creek at Poncha for 1918

Drainage Area, 89 Square Miles. Altitude, 7,471 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11	8	10	15	......	......	......	......	......	......	......	......
2	11	7	7	15	......	......	......	......	......	......	......	......
3	11	6	7	15	......	......	......	......	......	......	......	......
4	8	6	7	17	......	......	......	......	......	......	......	......
5	9	6	8	18	......	......	......	......	......	......	......	......
6	7	6	8	20	......	......	......	......	......	......	......	......
7	8	8	7	18	......	......	......	......	......	......	......	......
8	5	7	8	15	......	......	......	......	......	......	......	......
9	5	7	10	18	......	......	......	......	......	......	......	......
10	5	7	6	16	......	......	......	......	......	......	......	......
11	10	6	9	20	......	......	......	......	......	......	......	......
12	18	7	9	21	......	......	......	......	......	......	......	......
13	10	7	10	20	......	......	......	......	......	......	......	......
14	8	7	6	20	......	......	......	......	......	......	......	......
15	8	7	6	17	......	......	......	......	......	......	......	......
16	8	6	5	16	......	......	......	......	......	......	......	......
17	7	6	6	8	......	......	......	......	......	......	......	......
18	6	7	4	6	......	......	......	......	......	......	......	......
19	6	7	6	12	......	......	......	......	......	......	......	......
20	7	7	5	12	......	......	......	......	......	......	......	......
21	9	7	7	14	......	......	......	......	......	......	......	......
22	6	6	8	13	......	......	......	......	......	......	......	......
23	6	7	8	14	......	......	......	......	......	......	......	......
24	8	9	5	9	......	......	......	......	......	......	......	......
25	8	7	7	15	......	......	......	......	......	......	......	......
26	8	6	16	20	......	......	......	......	......	......	......	......
27	7	7	15	23	......	......	......	......	......	......	......	......
28	6	6	16	1	......	......	......	......	......	......	......	......
29	7	......	14	1	......	......	......	......	......	......	......	......
30	7	......	15	2	......	......	......	......	......	......	......	......
31	7	......	14	......	......	......	......	......	......	......	......	......
Total	247	190	269	431	......	......	......	......	......	......	......	......
Mean	8.0	6.8	8.7	14.4	......	......	......	......	......	......	......	......
Max.	18	9	16	23	......	......	......	......	......	......	......	......
Min.	5	6	4	1	......	......	......	......	......	......	......	......
Acre-ft.	492	378	535	857	......	......	......	......	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

PURGATOIRE RIVER AT TRINIDAD

Location.—At Commercial Street bridge.

Records Available.—April 1, 1916, to July 19, 1918. From 1897 to 1899 and 1905 to 1912 a station was maintained about 1,000 feet above the present location.

Drainage Area.—742 square miles.

Channel.—Shifting.

Gage.—Staff on concrete bridge.

Discharge Measurements.—Made by wading at low stages and from Animas Street bridge during high water.

Winter Flow.—Observations discontinued during the winter months.

Diversions.—There are decrees for diversions of 186 second-feet from the Purgatoire River above this station.

Accuracy.—Results for 1917 and 1918 cannot be considered better than fair.

Discharge of Purgatoire River at Trinidad for 1917.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	10	10	130	262	85	25	32	32	......
2	......	......	......	10	18	130	262	85	25	32	32	......
3	......	......	......	10	25	115	280	60	25	25	17	......
4	......	......	......	10	25	115	228	60	25	17	17	......
5	......	......	......	10	25	115	175	60	40	17	17	......
6	......	......	......	10	25	115	245	72	40	17	32	......
7	......	......	......	10	25	115	175	60	40	17	32	......
8	......	......	......	10	25	115	210	60	262	17	32	......
9	......	......	......	10	85	115	245	60	280	32	32	......
10	......	......	......	10	175	115	245	85	160	32	32	......
11	......	......	......	10	175	115	245	60	32	32	32	......
12	......	......	......	10	175	115	245	60	32	32	32	......
13	......	......	......	10	175	130	245	85	245	32	32	......
14	......	......	......	10	175	130	228	60	50	17	32	......
15	......	......	......	10	175	192	172	60	72	17	32	......
16	......	......	......	10	228	245	115	315	72	17	32	......
17	......	......	......	10	228	210	262	555	72	17	32	......
18	......	......	......	10	245	210	175	175	60	17	32	......
19	......	......	10	10	245	298	115	118	50	32	32	......
20	......	......	10	10	245	335	100	60	50	32	32	......
21	......	......	10	10	262	335	85	60	40	32	32	......
22	......	......	10	10	192	298	85	50	32	32	32	......
23	......	......	10	10	145	245	192	32	32	17	32	......
24	......	......	10	10	145	254	175	25	17	17	32	......
25	......	......	10	10	130	262	100	25	17	17	32	......
26	......	......	10	10	130	315	85	25	17	25	32	......
27	......	......	10	10	130	262	85	25	17	32	32	......
28	......	......	10	10	130	262	85	25	25	32	32	......
29	......	......	10	10	130	262	85	25	32	32	32	......
30	......	......	10	10	130	262	60	25	32	32	32	......
31	......	......	10	......	130	......	60	25	......	32	......	......
Total	......	......	130	300	4158	5917	5326	2577	1918	783	915	......
Mean	......	......	10	10	134	197	172	83.1	63.9	25.2	30.5	......
Max.	......	......	10	10	262	335	280	555	280	32	32	......
Min.	......	......	10	10	10	115	60	25	17	17	17	......
Acre-ft.	......	......	258	595	8240	11700	10600	5110	3800	1550	1810	......

Discharge of Purgatoire River at Trinidad for 1918.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	27	54	116	142	......	......	......	......	......
2	......	......	......	36	48	95	142	......	......	......	......	......
3	......	......	......	48	48	95	116	......	......	......	......	......
4	......	......	......	48	48	95	129	......	......	......	......	......
5	......	......	......	36	48	142	116	......	......	......	......	......
6	......	......	......	36	48	142	116	......	......	......	......	......
7	......	......	......	36	48	168	1220	......	......	......	......	......
8	......	......	......	36	38	184	366	......	......	......	......	......
9	......	......	......	36	36	194	286	......	......	......	......	......
10	......	......	......	36	27	200	1440	......	......	......	......	......
11	......	......	......	36	24	263	336	......	......	......	......	......
12	......	......	......	36	27	263	240	......	......	......	......	......
13	......	......	......	36	27	208	200	......	......	......	......	......
14	......	......	16	48	27	200	168	......	......	......	......	......
15	......	......	16	48	24	200	1240	......	......	......	......	......
16	......	......	16	48	24	168	200	......	......	......	......	......
17	......	......	16	48	24	168	286	......	......	......	......	......
18	......	......	16	48	24	168	200	......	......	......	......	......
19	......	......	16	36	48	184	286	......	......	......	......	......
20	......	......	16	36	48	184	......	......	......	......	......	......
21	......	......	16	36	60	200	......	......	......	......	......	......
22	......	......	27	36	60	200	......	......	......	......	......	......
23	......	......	21	36	95	184	......	......	......	......	......	......
24	......	......	16	121	95	184	......	......	......	......	......	......
25	......	......	16	121	116	184	......	......	......	......	......	......
26	......	......	16	121	95	200	......	......	......	......	......	......
27	......	......	16	142	95	200	......	......	......	......	......	......
28	......	......	16	54	116	174	......	......	......	......	......	......
29	......	......	27	54	116	168	......	......	......	......	......	......
30	......	......	27	54	116	168	......	......	......	......	......	......
31	......	......	27	......	116	......	......	......	......	......	......	......
Total	......	......	337	1570	1820	5299	7229	......	......	......	......	......
Mean	......	......	18.7	52.3	58.7	177	380	......	......	......	......	......
Max.	......	......	......	142	116	263	......	......	......	......	......	......
Min.	......	......	......	27	24	95	......	......	......	......	......	......
Acre-ft.	......	......	668	3110	3610	10500	14300	......	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

GRAND DRAINAGE

NORTH FORK OF GRAND RIVER NEAR GRAND LAKE

Location.—Three miles southwest of Grand Lake, in Sec. 13, T. 3 N., R. 76 W. Nearest tributary, Grand Lake outlet, enters some distance below; no tributaries for several miles above the station.

Records Available.—July 29, 1904, to September 30, 1909; September 20, 1910, to September 30, 1918.

Gage.—Vertical staff.

Drainage Area.—107 square miles.

Channel.—Practically permanent.

Discharge Measurements.—Made from highway bridge at the gage.

Winter Flow.—Ice forms along the edges, but springs keep the river open.

Diversions and Storage.—There are court decrees for diversions of 699 second-feet from the headwaters above the station. Of this amount 525 second-feet are for diversion across the divide into the headwaters of the Cache la Poudre. There is also a reservoir decree for 19,000 acre-feet from the flood water.

Accuracy.—Results considered good.

Co-operation.—Station maintained in co-operation with the United States Geological Survey.

GRAND RIVER AT HOT SULPHUR SPRINGS

Location.—At the bridge connecting the Denver, Northwestern & Pacific Railway station with the town of Sulphur Springs, in Sec. 2, T. 1 N., R. 78 W. Nearest tributary, Beaver Creek, enters the river 2 miles below the station.

Records Available.—July 22, 1904, to September 30, 1909, a station was maintained at this point by the United States Geological Survey; September 23, 1910, to November 16, 1918.

Drainage Area.—946 square miles.

Gage.—Chain gage.

Channel.—Somewhat shifting.

Discharge Measurements.—Made from bridge during high and ordinary stages and by wading during low water.

Winter Flow.—The river is frozen over during the winter months and discharge measurements are made to determine the winter flow.

Diversions.—Between this station and the mouth of North Fork there are court decrees for diversions of 96 second-feet from Grand River, and there is also a reservoir decree for 31,300 acre-feet from the flood waters of Grand River.

Accuracy.—Results considered good.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of North Fork Grand River at Grand Lake for 1917.

Drainage Area, 107 Square Miles. Altitude, 8,153 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	41	29	28	28	84	175	1170	175	62	48	38	36
2	41	29	28	28	71	175	1100	163	60	60	36	35
3	40	29	28	28	71	203	1030	145	58	56	36	33
4	39	29	28	27	71	250	890	120	56	50	39	32
5	38	29	27	27	69	290	685	110	52	48	41	30
6	37	29	28	28	71	226	620	100	60	48	52	27
7	35	29	28	27	69	250	588	97	71	45	50	27
8	33	29	28	27	67	335	555	97	62	43	43	26
9	32	29	28	28	67	440	440	90	60	41	41	26
10	31	29	28	28	74	685	440	84	58	41	41	26
11	31	29	27	28	90	1030	555	84	60	39	41	27
12	31	28	27	28	145	620	495	84	58	39	41	27
13	31	28	27	28	210	750	440	84	60	38	39	28
14	31	28	27	29	290	890	385	84	64	38	37	28
15	31	29	27	29	360	960	335	81	60	39	36	30
16	31	29	28	32	555	1240	290	79	58	38	38	32
17	30	29	28	41	525	1400	290	81	56	39	36	32
18	29	28	28	69	495	1470	290	84	54	39	39	31
19	29	28	28	64	440	1540	250	84	52	39	41	31
20	29	28	28	69	440	1400	250	81	50	39	41	32
21	28	28	27	71	440	1240	242	76	50	39	45	33
22	28	28	27	116	290	1470	242	74	50	39	45	41
23	28	28	27	145	250	1620	234	71	52	39	41	49
24	29	28	27	210	210	1400	234	71	54	38	39	38
25	29	27	27	203	210	1470	234	69	56	38	39	38
26	29	27	27	196	210	1100	250	74	50	38	38	30
27	30	27	27	189	196	1400	242	81	50	38	35	32
28	30	28	28	145	175	1400	175	87	50	37	35	33
29	30	......	29	100	175	1240	203	79	50	36	36	33
30	29	......	28	84	175	1240	196	67	50	37	38	33
31	29	......	28	......	226	......	175	64	......	38	......	33
Total	989	795	856	2152	6821	27909	13525	2820	1683	1284	1197	979
Mean	31.9	28.4	27.6	71.7	220	930	436	91.0	56.1	41.4	39.9	31.6
Max.	41	29	29	210	555	1620	1170	175	71	60	52	49
Min.	28	27	27	27	67	175	175	64	50	36	35	26
Acre-ft.	1960	1580	1700	4270	13500	55300	26800	5600	3340	2550	2370	1940

Discharge of North Fork Grand River Near Grand Lake for 1918.

Drainage Area, 107 Square Miles. Altitude, 8,153 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	30	15	12	43	100	620	210	81	71	......	......	......
2	28	15	14	45	120	440	250	79	84	......	......	......
3	28	15	14	46	145	555	290	71	71	......	......	......
4	28	15	14	45	290	620	250	71	60	......	......	......
5	27	15	14	43	250	685	210	84	64	......	......	......
6	27	15	14	43	335	820	175	100	50	......	......	......
7	25	14	14	43	385	960	145	94	48	......	......	......
8	24	14	14	45	385	1030	175	84	41	......	......	......
9	21	14	15	48	440	1100	182	71	45	......	......	......
10	20	14	14	52	290	1240	250	69	48	......	......	......
11	18	14	14	67	290	1320	145	71	45	......	......	......
12	17	14	14	74	210	1100	218	60	43	......	......	......
13	16	14	13	87	290	1470	290	84	41	......	......	......
14	16	14	12	87	175	1620	210	71	41	......	......	......
15	16	12	12	84	210	1840	196	71	46	......	......	......
16	16	12	12	84	335	1840	242	60	46	......	......	......
17	16	12	12	71	385	1470	175	60	50	......	......	......
18	16	12	13	71	385	1470	145	60	48	......	......	......
19	16	13	14	71	385	890	157	60	46	......	......	......
20	16	12	16	67	385	890	210	60	33	......	......	......
21	16	12	20	62	440	960	203	58	46	......	......	......
22	16	13	24	58	440	890	175	56	48	......	......	......
23	16	14	31	58	495	820	163	60	50	......	......	......
24	16	14	32	58	652	820	120	60	50	......	......	......
25	16	14	34	58	685	718	112	50	46	......	......	......
26	18	12	36	60	620	555	116	50	50	......	......	......
27	18	12	38	67	620	495	120	60	50	......	......	......
28	17	11	40	71	685	440	120	48	50	......	......	......
29	16	......	43	68	685	335	100	41	46	......	......	......
30	16	......	43	81	750	290	94	39	50	......	......	......
31	15	......	43	......	750	......	84	41	......	......	......	......
Total	601	377	655	1857	12612	28303	5532	2024	1507	......	......	......
Mean	19.4	13.5	21.1	61.9	407	943	178	65.3	50.2	......	......	......
Max.	30	15	43	87	750	1840	290	100	84	......	......	......
Min.	15	11	12	43	100	290	84	39	33	......	......	......
Acre-ft.	1190	750	1300	3680	25000	56100	10900	4020	1507	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Grand River at Hot Sulphur Springs for 1917.
Drainage Area, 946 Square Miles. Altitude, 7,665 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	162	98	112	280	550	1580	5770	1160	337	200	155	163
2	162	98	112	280	550	1360	5230	975	317	207	156	153
3	162	105	114	298	497	1360	4520	850	317	234	160	155
4	162	112	120	317	472	1700	3910	772	280	205	148	150
5	162	114	120	357	497	2330	3910	700	263	202	168	146
6	162	116	125	378	378	2070	4060	665	280	190	162	141
7	156	120	125	400	447	2070	3760	635	317	186	163	125
8	153	125	128	447	400	2200	4060	605	317	186	155	121
9	153	125	132	472	424	3020	3760	524	298	182	160	123
10	153	125	132	550	447	4210	3760	578	280	176	158	125
11	153	125	133	524	524	5050	3610	524	246	168	146	132
12	138	125	135	550	665	4690	3610	550	263	170	150	132
13	105	125	138	561	772	4870	3020	550	246	168	150	132
14	120	122	138	605	1060	5050	2740	550	280	167	163	132
15	132	122	138	578	1700	5590	2330	550	280	165	172	132
16	138	123	138	550	2330	6310	2070	497	298	167	163	132
17	138	125	138	578	3160	6680	1940	524	280	163	162	130
18	138	125	141	890	3610	6870	1700	497	246	155	147	132
19	138	125	141	635	3460	6490	1820	497	230	148	138	138
20	138	125	144	447	2880	6310	2070	497	230	172	138	141
21	138	125	146	524	2460	6130	1700	497	215	167	147	144
22	138	125	146	424	2070	6130	1580	447	215	178	153	144
23	138	125	150	700	1820	6870	1480	400	215	165	162	138
24	138	125	153	1160	1580	6490	1580	357	210	167	162	135
25	138	123	153	975	1700	6490	1360	357	202	174	156	125
26	132	120	162	890	1700	6310	1580	337	215	178	148	125
27	132	116	170	975	1480	6490	1480	357	218	162	141	128
28	125	114	190	772	1360	5770	1260	400	215	184	138	130
29	125	......	215	700	1260	5590	1160	424	202	180	141	128
30	114	......	317	524	1360	5770	1360	357	202	175	153	128
31	105	......	280	......	1210	......	1360	357	......	170	......	125
Total..	4348	3353	4686	17341	42823	141850	83550	16990	7714	5531	4615	4182
Mean......	140	120	151	578	1380	4730	2700	548	257	178	154	135
Max.	162	125	317	1160	3610	6870	5770	1160	337	234	172	163
Min.........	105	98	112	280	378	1360	1160	337	202	148	138	121
Acre-ft...	8610	6660	9280	34400	84800	281000	166000	33700	15300	10900	9160	8300

Discharge of Grand River at Hot Sulphur Springs for 1918.
Drainage Area, 946 Square Miles. Altitude, 7,665 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	125	120	98	141	424	3310	2400	472	221	337	263	......
2	125	114	102	146	578	2880	2260	497	230	337	246	......
3	125	114	105	153	665	2880	2260	534	263	357	246	......
4	123	125	108	162	1020	2880	2260	472	317	337	246	......
5	120	128	110	170	1530	3310	2010	578	290	378	317	......
6	116	125	112	190	1760	3910	1640	635	263	424	280	......
7	114	125	114	210	2010	4520	1760	605	337	424	246	......
8	114	125	114	215	2260	4870	1530	497	298	424	263	......
9	109	125	114	280	2670	5230	1420	447	280	378	263	......
10	105	125	114	337	2140	5770	1640	472	298	424	263	......
11	105	125	114	317	1760	7060	1640	424	280	424	263	......
12	105	123	114	447	1310	7250	1530	378	280	378	263	......
13	105	120	110	550	1110	7440	2010	400	263	357	263	......
14	109	114	107	665	1310	8580	1760	378	218	357	263	......
15	110	105	105	550	1640	7820	1420	400	210	317	263	......
16	110	112	105	447	2330	6680	1420	357	246	298	237	......
17	110	114	107	378	2460	6310	1420	337	298	298	......	......
18	110	114	110	337	2600	6310	1310	317	263	298	......	......
19	110	114	114	280	2600	5950	1210	298	246	280	......	......
20	112	105	116	215	2600	5950	1020	280	246	263	......	......
21	112	114	114	280	2460	5950	1110	298	227	280	......	......
22	112	114	114	317	2460	6130	1210	280	215	298	......	......
23	112	114	114	317	2600	5770	890	280	243	317	......	......
24	114	114	114	337	3020	5410	890	263	280	298	......	......
25	118	107	116	378	3610	4870	850	246	298	280	......	......
26	125	102	120	497	3610	4360	810	246	298	263	......	......
27	125	98	123	550	3310	4060	700	230	298	263	......	......
28	116	98	125	400	3610	3310	635	246	280	298	......	......
29	120	......	128	357	3910	2880	635	227	298	263	......	......
30	123	......	132	357	3610	2600	578	210	337	298	......	......
31	125	......	138	......	4060	......	550	200	......	240	......	......
Total..	3564	3233	3531	9980	71037	154250	42778	11504	8121	10188	4185	......
Mean......	115	115	114	333	2290	5140	1380	371	271	329	262	......
Max.	......	......	......	665	4060	8580	2400	635	337	424	......	......
Min.........	......	......	......	141	424	2600	550	200	210	240	......	......
Acre-ft...	7070	6390	7010	19800	141000	306000	84800	22800	16100	20200	8310	......

Unless otherwise noted, all discharges are in cubic feet per second.

GRAND RIVER NEAR KREMMLING

Location.—At the entrance to Gore Canyon, 3 miles southwest of Kremmling, in Sec. 23, T. 1 N., R. 81 W. Nearest tributary, Blue River, enters a mile below Kremmling.

Records Available.—July 24, 1904, to September 30, 1918.

Drainage Area.—2,380 square miles.

Gage.—Automatic recording gage.

Channel.—Somewhat shifting.

Winter Flow.—Rapids below the station remain open and thus prevent backwater except for short periods when ice jams on the rapids.

Diversions.—Between this station and that at Sulphur Springs there are court decrees for diversions of 34 second-feet from Grand River and 2,315 second-feet from intervening tributaries exclusive of diversions for placer mining in the Blue River drainage.

Accuracy.—Although the channel is somewhat shifting, sufficient discharge measurements have been made to form a basis for fairly reliable estimates of flow.

Co-operation.—Station maintained in co-operation with the United States Geological Survey.

Station discontinued September 30, 1918.

GRAND RIVER AT GLENWOOD SPRINGS

Location.—At Glenwood Springs, at the point where the discharge from the hot springs enters the river. No Name Creek enters Grand River about 2 miles above the station and Roaring Fork enters one-half mile below.

Records Available.—May 12, 1899, to November 30, 1918.

Drainage Area.—4,520 square miles.

Gage.—Chain gage originally installed at the railroad bridge just above the Roaring Fork, but in 1900 a staff gage was installed at the present location. Since 1902 a number of automatic gages referred to the staff gage datum have been used, the present one being a Friez gage.

Channel.—Slightly shifting.

Discharge Measurements.—Made from a car and cable stretched beneath the State Street bridge, which crosses the river one-third mile below the gage.

Winter Flow.—Ice never forms at the station, as the hot water from the springs keeps the water above the freezing point.

Artificial Control.—The Shoshone power plant of the Central Colorado Power Company, 6 miles above Glenwood Springs, has sufficient pondage to withhold the flow of the river for a portion of the day during low-water periods.

Diversions.—Between this station and the one near Kremmling there are court decrees for a diversion of 13 second-feet from Grand River for irrigation, 1,250 second-feet absolute for power and 14,400 second-feet conditional for power.

Accuracy.—Conditions are favorable for accurate results and the estimates are considered reliable.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of Grand River at Kremmling for 1917.
Drainage Area 2,380 Square Miles. Altitude, 7,320 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	390	365	390	860	1680	4580	12300	2490	940	625	500	576
2	390	365	390	800	1680	4050	11500	2190	905	650	525	546
3	390	380	390	600	1680	5200	10100	1980	870	670	550	486
4	396	390	378	480	1530	6000	8800	1830	835	635	576	456
5	399	385	378	435	1580	6100	8200	1780	835	600	576	411
6	402	378	405	465	1410	5660	7960	1680	800	585	576	426
7	405	370	390	570	1490	5160	7600	1630	835	550	576	320
8	405	365	352	660	1410	5360	7720	1530	905	450	576	235
9	408	365	390	1050	1330	7000	8200	1450	905	540	561	......
10	414	365	378	1530	1410	9310	7840	1410	835	560	531	......
11	420	365	378	1730	1580	11600	7240	1410	835	560	501	......
12	420	365	378	2130	1830	12200	6760	1410	800	540	501	......
13	420	365	378	2550	2190	11900	5990	1410	835	489	501	......
14	378	365	352	2430	2850	12200	5260	1450	835	535	531	......
15	365	365	365	1930	4130	13000	4860	1490	870	510	546	......
16	378	360	365	1450	5660	13600	4310	1450	870	483	561	......
17	390	352	340	1530	7120	14400	4310	1410	835	495	516	......
18	365	370	340	2310	8200	14800	3650	1410	765	516	441	......
19	365	380	340	1880	8440	15000	3570	1370	730	471	370	......
20	370	405	352	1330	7840	14800	3810	1370	678	516	426	......
21	378	435	352	1330	6760	14200	3570	1330	645	546	486	......
22	365	420	365	1980	5460	14000	3270	1250	630	516	516	......
23	378	420	352	2990	4760	14100	3130	1170	615	531	516	......
24	378	402	328	3340	4580	14200	3270	1130	600	516	486	......
25	390	405	340	3060	4760	13900	3130	1050	585	546	546	......
26	405	405	352	2730	4580	13900	3130	1050	585	561	531	......
27	390	390	300	2850	4220	13700	3060	1010	600	546	516	......
28	385	365	328	2550	3810	13300	2790	975	600	576	456	......
29	380	......	405	2190	3810	12700	2610	1090	600	456	396	......
30	378	......	835	1830	3890	12400	2670	1050	615	460	546	......
31	365	......	900	....	4220	....	2730	975	......	475	......	......
Total	12062	10662	12286	51570	115800	328320	173330	44230	22793	16709	15436	*12781
Mean	389	381	396	1720	3740	10900	5590	1430	760	539	515	412
Max	420	435	900	3340	8440	15000	12300	2490	940	670	576	.....
Min	365	352	300	435	1330	4050	2610	975	585	450	370	......
Acre-ft.	23900	21200	24300	102000	230000	649000	344000	87900	45200	33100	30600	*25300

*Estimated for 31 days.

Discharge of Grand River near Kremmling for 1918.
Drainage Area 2,380 Square Miles. Altitude, 7.320 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	1010	1250	7720	5360	1490	730	......	......	......
2	......	......	......	1090	1580	6540	4860	1450	730	......	......	......
3	......	......	......	1090	1930	6430	4760	1450	800	......	......	......
4	......	......	......	1090	2610	7000	4860	1490	835	......	......	......
5	......	......	......	975	3570	7950	4490	1580	975	......	......	......
6	......	......	406	870	4400	8800	4130	1680	1050	......	......	......
7	......	......	......	835	4860	9700	3890	1680	1010	......	......	......
8	......	......	......	800	5060	10600	3650	1580	940	......	......	......
9	......	......	......	835	5560	11400	3570	1410	940	......	......	......
10	......	......	......	1010	5360	13800	3570	1370	1010	......	......	......
11	......	......	......	1050	4580	14200	3810	1330	1050	......	......	......
12	......	......	......	1170	3810	15400	3570	1290	1010	......	......	......
13	......	......	......	1450	3410	16000	3970	1290	940	......	......	......
14	......	......	......	1730	3810	16500	3970	1250	870	......	......	......
15	......	......	......	1780	4310	16500	3410	1250	835	......	......	......
16	......	......	......	1450	5660	15800	3270	1250	835	......	......	......
17	......	......	......	1250	6210	14900	3340	1170	905	......	......	......
18	......	......	......	1130	6430	14500	3060	1090	905	......	......	......
19	......	......	......	1050	6430	14000	2850	1090	835	......	......	......
20	......	......	......	905	6320	13200	2670	1050	800	......	......	......
21	......	......	......	940	6320	13500	2730	1010	765	......	......	......
22	......	......	......	975	6320	13500	2610	975	730	......	......	......
23	......	......	......	1010	6820	13300	2550	940	730	......	......	......
24	......	......	......	1050	7650	13000	2310	905	765	......	......	......
25	......	......	......	1210	8560	12400	2310	870	835	......	......	......
26	......	......	......	1330	8680	10900	2190	835	905	......	......	......
27	......	......	......	1580	8200	9570	1980	800	940	......	......	......
28	......	......	......	1490	8200	8320	1830	765	940	......	......	......
29	......	......	905	1290	8200	7120	1780	765	905	......	......	......
30	......	......	870	1210	8000	6210	1680	730	870	......	......	......
31	......	......	1010	....	7750	....	1580	730	......	......	......	......
Total	*11594	*10500	*15810	34655	171850	348760	100610	36565	26390	......	......	......
Mean	374	375	510	1160	5540	11600	3250	1180	880	......	......	......
Max	......	......	......	1780	8680	16500	5360	1680	1050	......	......	......
Min	......	......	......	800	1250	6210	1580	730	730	......	......	......
Acre-ft.	*23000	*20800	*31400	69000	341000	690000	200000	72600	52400	......	......	......

*Estimated for full months.

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Grand River at Glenwood Springs for 1917.

Drainage Area 4,520 Square Miles. Altitude, 5,747 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	648	692	669	1240	3110	8720	20800	4490	1740	1220	1140	1060
2	683	609	655	1380	2930	8060	19500	3920	1740	1220	1190	1020
3	739	753	690	1130	2930	7740	17400	3500	1740	1290	1260	1050
4	824	753	560	1110	2840	9060	15700	3300	1620	1360	1230	1180
5	669	763	648	1090	2840	10800	13900	3110	1500	1350	1250	1120
6	634	760	690	1080	2840	10800	13500	2930	1500	1260	1240	992
7	524	746	655	1010	2600	10100	12700	2840	1380	1240	1200	840
8	524	690	662	1330	2600	10100	12700	2680	1560	1190	1190	880
9	524	718	697	1680	2600	12700	13100	2450	1740	1080	1190	760
10	524	746	739	2180	2450	17000	12700	2450	1620	1180	1210	754
11	524	648	648	2680	2680	20400	12300	2450	1560	1220	1140	850
12	520	711	690	2930	2930	21700	11200	2450	1620	1220	1200	838
13	600	739	704	3710	3500	21700	10100	2450	1620	1230	1210	988
14	683	732	683	3710	4490	21700	9060	2520	1680	1110	1550	1090
15	732	683	718	3710	6800	23400	8390	2600	1740	1150	1190	1120
16	718	683	676	2930	9400	25100	7740	2600	1800	1220	1210	965
17	732	760	739	2450	12300	26800	7110	2380	1620	1190	1220	918
18	704	739	627	2760	14400	28100	6200	2380	1500	1190	1110	898
19	746	753	648	3300	15200	28600	6200	2310	1500	1130	1030	892
20	800	718	718	2680	14800	28100	6200	2310	1440	1110	956	987
21	807	753	725	2180	12700	26800	6200	2310	1380	1030	1020	992
22	768	718	912	2450	10800	26000	5910	2240	1330	1150	1090	983
23	684	739	704	4030	9420	26400	5500	2120	1320	1130	1160	992
24	691	784	725	5360	8720	26000	5360	1920	1330	1130	1230	1030
25	784	784	711	5630	8720	25600	5500	1920	1300	1180	1140	872
26	824	880	718	5230	8720	25100	5360	1920	1240	1200	1200	1080
27	812	808	683	5100	8390	24300	5100	1860	1330	1200	1150	965
28	778	753	792	4980	7740	23000	4980	1980	1330	1150	1200	965
29	762	......	1380	4260	7740	21700	4490	1980	1440	1140	1000	965
30	795	......	1860	3600	7740	21700	4610	1980	1280	1150	1020	947
31	768	......	1560	....	8060	....	4730	1920	....	1070	....	929
Total	21525	20620	24286	86910	212970	597280	294240	78210	45500	36690	34726	29922
Mean....	694	736	783	2900	6870	19900	9490	2520	1520	1180	1160	965
Max......	824	880	1860	5630	15200	28600	20800	4490	1800	1360	1260	1180
Min.......	520	609	560	1010	2450	7740	4490	1860	1240	1030	956	754
Acre-ft.	42700	40900	48100	173000	422000	1180000	584000	155000	90400	72600	69000	59300

Discharge of Grand River at Glenwood Springs for 1918.

Drainage Area, 4,520 Square Miles. Altitude 5,747 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	850	779	920	1920	2240	11600	8720	2560	1190	1680	1320	......
2	915	737	800	1920	2450	10800	8060	2430	1260	1500	1290	......
3	864	751	737	1980	2930	10800	7420	2310	1330	1620	1330	......
4	869	824	937	2050	3710	11900	7740	2240	1440	1620	1330	......
5	901	920	744	1920	5360	13100	7420	2310	1680	1560	1380	......
6	870	848	1040	1800	6800	13900	6800	2450	1980	1560	1440	......
7	836	896	1130	1620	8060	16100	6500	2600	1920	1620	1500	......
8	879	960	1180	1560	8390	17800	6200	2450	1860	1560	1240	......
9	935	864	1260	1500	8720	19500	6200	2310	1810	1560	1220	......
10	774	870	1210	1680	9060	21700	6200	2310	1950	1560	1170	......
11	606	876	1190	1980	8060	24300	6200	2210	2180	1620	1140	......
12	606	882	1370	2180	7110	27300	6200	2110	2130	1680	1130	......
13	681	888	1760	2450	6200	28600	5910	2010	1980	1620	1140	......
14	758	895	1540	2840	6200	29400	6200	1910	1820	1500	1130	......
15	861	901	1330	3110	7110	29400	5910	1820	1740	1440	1150	......
16	952	907	1140	2840	8390	28600	5230	1720	1620	1380	1240	......
17	832	913	945	2450	10100	26800	5230	1620	1680	1330	1260	......
18	786	920	1070	2240	10800	25100	5110	1680	1740	1330	1150	......
19	880	896	1080	2050	11200	23400	4730	1560	1620	1330	1100	......
20	739	800	1050	1920	11200	21700	4490	1500	1500	1320	1050	......
21	702	848	1040	1740	10800	21700	4370	1440	1380	1270	1100	......
22	667	1010	1110	1800	10800	21700	4370	1440	1440	1380	1100	......
23	800	824	1560	1860	11600	22100	4030	1440	1380	1330	1130	......
24	880	816	1620	1920	12700	22100	3820	1380	1560	1380	920	......
25	944	996	1620	2050	14400	20400	3710	1380	1620	1380	987	......
26	896	1100	1620	2240	14400	17800	3600	1300	1680	1330	944	......
27	919	896	1740	2520	14400	15700	3400	1210	1740	1310	751	......
28	823	880	1920	2760	13500	13100	3110	1210	1740	1270	896	......
29	858	......	1800	2520	13500	11600	2930	1180	1740	1240	896	......
30	892	......	1680	2310	13100	10100	2810	1190	1680	1330	824	......
31	822	......	1680	....	12300	....	2680	1190	....	1330	......	......
Total	25597	24697	39823	63730	285590	588100	165290	56470	50390	44940	34258	......
Mean....	826	882	1280	2120	9210	19600	5330	1820	1680	1450	1140	......
Max......	952	1100	1920	3110	14400	29400	8720	2600	2180	1680	1500	......
Min.......	606	737	737	1500	2240	10100	2680	1180	1190	1270	751	......
Acre-ft.	50800	49000	78700	126000	566000	1170000	328000	112000	100000	89200	67800	......

Unless otherwise noted, all discharges are in cubic feet per second.

GRAND RIVER NEAR PALISADES

Location.—At the State bridge 2 miles above Palisades, in Sec. 2, T. 11 S., R. 98 W. Nearest important tributary, Plateau Creek, enters about 6 miles above the station.

Records Available.—April 9, 1902, to November 30, 1918.

Drainage Area.—8,550 square miles.

Gage.—Chain gage; location and datum unchanged.

Channel.—Practically permanent.

Discharge Measurements.—Made from bridge in Palisades.

Winter Flow.—The river usually freezes over a portion of the year, but except for slush and ice and an occasional thin ice cover the effect on the gage heights is slight.

Diversions.—There are court decrees for diversions of 1,828 second-feet from Grand River and 2,500 second-feet from intervening tributaries between Palisades and the Glenwood Springs station. The proposed high line canal of the United States Reclamation Service will divert 700 second-feet 7 miles above the Palisades station. Below the station the Grand Valley Irrigation Co. has a diversion of 400 second-feet.

Accuracy.—Conditions are favorable for accurate results, and the estimates should be reliable.

Co-operation.—Records furnished by the United States Geological Survey.

GRAND RIVER NEAR FRUITA

Location.—At highway bridge, 1½ miles south of Fruita, in Sec. 20, T. 1 N., R. 2 W., Ute principal meridian. Nearest important tributary, Little Salt Wash, enters a mile below the station; Gunnison River enters at Grand Junction, about 12 miles above.

Records Available.—Flood records during 1908, 1909, and 1910; April 1, 1911 (station established), to November 30, 1918.

Drainage Area.—16,800 square miles.

Gage.—Chain gage; datum was raised 0.05 foot May 3, 1911.

Channel.—Shifts at high water.

Discharge Measurements.—Made from the highway bridge.

Winter Flow.—The river is frozen over during a portion of the year and readings are discontinued.

Diversions.—Between the Palisades station and Fruita there are decrees for 788 second-feet from the Grand River.

Maximum Stage.—Since the establishment of the station the maximum stage has been 15.0 feet, which occurred June 9, 1909. The highest stage known was about 18.5 feet on July 4, 1884.

Accuracy.—Results considered good.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of Grand River at Palisades for 1917.

Drainage Area, 8,550 Square Miles. Altitude, 4,730 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec
1	1880	......	1760	2540	7020	16800	36400	8480	2620	2320	2060	1880
2	1820	......	1530	2180	6470	16000	33100	7590	2390	2540	2120	1760
3	1940	......	1580	2320	6470	15800	32200	6600	2250	2390	2250	1640
4	1940	......	1420	1940	6470	18000	38700	6080	2390	2460	2180	1530
5	1940	......	1480	1880	6210	20800	26000	5480	2180	2460	2180	1700
6	1480	......	1580	1940	5840	21600	24800	5250	2120	2390	2180	1580
7	1700	......	1530	2000	5600	21000	23800	5030	2120	2390	2120	1530
8	1760	......	1580	2060	5480	21000	22100	4700	2120	2320	2120	1530
9	1700	......	1580	2460	5480	24500	22800	4280	2250	2250	2120	1480
10	1820	......	1640	3210	5480	31300	22800	3980	2390	2250	2120	1480
11	1700	......	1640	3680	5840	36100	21900	4180	3030	2180	2120	1420
12	1820	......	1530	4390	6740	37900	20500	4180	3210	2180	1880	1520
13	1880	......	1530	5140	7440	38200	18800	4180	3030	2320	1880	1530
14	1700	......	1530	5960	9580	38800	17200	4180	3030	2250	2000	1640
15	1880	......	1580	5140	13800	40800	16000	4180	3030	2000	2000	1760
16	1640	......	1530	5140	19000	44200	14500	4080	3120	2120	2000	1760
17	1760	......	1480	4390	23300	46400	13400	3980	3030	2180	2120	1530
18	1940	......	1530	4390	26300	48100	12200	3780	2860	2180	2120	1530
19	1940	......	1480	5140	27900	50000	11700	3780	2780	2180	1940	1420
20	1940	......	1640	4600	26800	50000	11500	3580	2620	2180	1880	1480
21	2000	......	1640	3780	24800	46600	11400	3580	2540	2120	2000	1880
22	1820	......	1940	3780	21000	45000	10900	3390	2390	2060	1940	1820
23	1820	......	1760	5140	18800	45400	10100	2620	2390	2120	1940	1700
24	1700	......	1480	7880	18200	45000	9900	2940	2320	2120	1940	1760
25	1700	......	1530	9100	18400	44700	10600	2700	2250	2120	2000	1760
26	....	......	1580	9580	17800	44700	10200	2620	2250	2180	2000	1640
27	....	......	1480	11500	16600	43600	10600	2620	2250	2180	2120	1940
28	....	......	1580	10500	15800	42200	9580	2860	2320	2180	2120	1700
29	....	......	2320	9900	15600	38900	8640	2860	2460	2060	2120	1700
30	....	......	3880	7740	16000	38900	9100	2940	2460	2000	2120	1760
31	....	......	4500	....	17200	....	9100	2780	....	2060	....	1700
Total	45220	......	54840	149400	427420	1072300	550520	129480	76200	68740	61690	51070
Mean	1810	......	1770	4980	13800	35700	17800	4180	2540	2220	2060	1650
Max	2000	......	4500	11500	27900	50000	36400	8480	3210	2540	2250	1940
Min	1480	......	1420	1880	5480	15800	8640	2620	2120	2000	1880	1420
Acre-ft.	89800	......	109000	296000	848000	2120000	1090000	257000	151000	136000	123000	101000

Discharge of Grand River near Palisades for 1918.

Drainage Area, 8,550 Square Miles. Altitude, 4,730 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	1530	2940	4180	17000	15800	3300	1530	2390	2390	......
2	......	......	1580	3680	4500	16400	14100	3120	1530	2320	2390	......
3	......	......	1530	3480	5140	16800	13200	2860	1530	2250	2390	......
4	......	......	1580	3580	6340	18600	13400	2940	1820	2250	2390	......
5	......	......	1820	3480	8640	20800	13400	2940	2120	2250	2390	......
6	......	......	2620	3120	11200	22300	12400	3480	2540	2250	2390	......
7	......	......	2860	2780	12900	24500	11500	3480	2700	2120	2390	......
8	......	......	3680	2700	13600	27400	10400	3780	2460	2120	2460	......
9	......	......	2940	2540	13900	30100	10400	3480	2620	2120	2060	......
10	......	......	2390	2620	14300	33400	10400	2860	2700	2250	2000	......
11	......	......	2320	3120	13400	38200	10100	2860	3480	2250	2000	......
12	......	......	2700	3780	11200	42600	9900	2700	3680	2390	2000	......
13	......	......	5030	4500	10200	45400	9580	2540	3480	2390	2000	......
14	......	......	3480	5030	9900	48000	9740	2700	3120	2250	2000	......
15	......	......	2540	5360	11400	47700	9420	2780	2780	2250	2060	......
16	......	......	2250	5030	13900	46200	8480	2540	2540	2250	2250	......
17	......	......	2120	4500	16200	44400	8030	2390	2540	2120	2250	......
18	......	......	2060	3980	18000	41200	7880	2320	2540	2120	1580	......
19	......	......	2120	3480	18600	37600	7160	2180	2540	2120	2120	......
20	......	......	2120	3120	18600	35500	7020	2060	2320	2120	2060	......
21	......	......	2120	2940	18000	34600	6470	1940	2250	2120	2000	......
22	......	......	2180	2460	18600	35200	6210	1880	2000	2180	2000	......
23	......	......	2180	2940	19200	34600	6080	1820	2180	2120	2000	......
24	......	......	2460	3120	20800	36100	5720	1760	2700	2120	2000	......
25	......	......	2700	3480	22100	33100	5720	1700	2390	2250	1700	......
26	......	......	2780	3880	22100	29000	5250	1580	2390	2320	2060	......
27	......	......	2540	4500	22100	25500	4810	1580	2460	2180	1820	......
28	......	......	3030	4810	21200	22800	4500	1480	2460	2120	1530	......
29	......	......	3210	4500	20500	20100	4080	1480	2180	2180	1580	......
30	......	......	2940	3980	19500	17400	3780	1480	2390	2120	1640	......
31	......	......	2940	....	18000	....	3680	1530	....	2250	....	......
Total	......	......	78350	109430	458000	942000	268610	75540	73970	68540	61900	......
Mean	......	......	2530	3650	14800	31400	8660	2440	2470	2210	2060	......
Max	......	......	5030	5360	22100	48000	15800	3780	3680	2390	2460	......
Min	......	......	1530	2460	4180	16400	3680	1480	1530	2120	1530	......
Acre-ft.	......	......	156000	217000	910000	1870000	532000	150000	147000	136000	123000	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Grand River near Fruita for 1917.
Drainage Area, 16,800 Square Miles. Altitude, 4,500 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	5250	11000	23900	43300	12800	3200	3040	2880	2880
2	......	......	......	3940	10700	22800	41100	11000	3040	3200	2880	2880
3	......	......	......	3770	12100	22200	38800	9400	3040	3200	2880	2880
4	......	......	......	3450	11700	24500	35900	7940	3040	3040	3040	2880
5	......	......	......	3290	11400	28900	34500	8080	3200	3040	3040	2880
6	......	......	......	3290	10700	32400	31000	7540	3200	3040	3200	2580
7	......	......	......	3450	10300	31000	29600	7400	3040	3040	3040	2580
8	......	......	......	3450	10000	31000	28200	6880	2730	2880	3040	2580
9	......	......	......	3770	10000	35200	27600	5780	2730	2730	3040	2580
10	......	......	......	5450	9710	45500	27600	4940	2880	2730	3040	2580
11	......	......	......	6080	10000	52200	26300	5640	3540	2730	2880	2580
12	......	......	......	6300	11000	52200	25000	5880	3910	2730	2880	......
13	......	......	2560	7470	13200	52200	23900	6630	3910	2880	2880	......
14	......	......	2560	8830	15600	51400	21200	6880	4300	2730	2880	......
15	......	......	2700	9120	22200	54400	20600	7140	4100	2580	2880	......
16	......	......	2560	8550	31700	57300	17800	6130	3910	2580	3040	......
17	......	......	2560	6520	38100	59600	16000	5640	3910	2580	3040	......
18	......	......	2430	6750	41800	61000	15200	5170	3910	2730	2880	......
19	......	......	2700	6980	43300	61800	14800	5640	3540	2730	2730	......
20	......	......	2430	6980	41100	62500	14400	4940	3370	2730	2730	......
21	......	......	2700	6300	38100	58100	14400	4720	3200	2730	2730	......
22	......	......	2990	6080	33100	57300	13600	4100	3200	2880	2730	......
23	......	......	2990	8550	29600	56600	12900	3720	3040	2880	2730	......
24	......	......	2700	12100	28900	55900	12100	3720	2880	3040	3040	......
25	......	......	2560	12100	28200	55100	13600	3370	3040	2880	3040	......
26	......	......	2840	15200	26900	53600	14400	3370	3040	2880	3040	......
27	......	......	2990	15600	25000	52200	14400	3200	3200	3040	3040	......
28	......	......	2700	16500	23300	51400	13600	3370	3370	3200	3040	......
29	......	......	3610	14800	22800	47700	12900	3540	3370	3040	3040	......
30	......	......	5050	12900	23900	44800	12100	3540	3040	2880	2880	......
31	......	......	4660	....	24500	....	13200	3370	....	2880	....	......
Total	83700	72800	87490	232820	679910	1394700	680000	181470	99880	89270	88210	......
Mean....	2700	2600	2820	7760	21900	46500	21900	5850	3330	2880	2940	......
Max......	......	......	5050	16500	43300	62500	43300	12800	4300	3200	3200	......
Min.......	......	......	2430	3290	9710	22200	12100	3200	2730	2580	2730	......
Acre-feet..	166000	144000	173000	462000	1350000	2770000	1350000	360000	198000	177000	175000	......

March 1 to 13, Est. 2600.

Discharge of Grand River near Fruita for 1918.
Drainage Area, 16,800 Square Miles. Altitude, 4,500 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	3200	5170	8510	22800	18700	3540	1800	3540	3720	......
2	......	......	2580	5640	9600	21700	16700	3540	1800	3370	3540	......
3	......	......	2730	5880	10200	20200	14200	3540	1800	3370	3540	......
4	......	......	2730	5880	12200	22700	15000	3540	2580	3370	3540	......
5	......	......	2880	5880	14600	25200	14600	3370	2580	3370	3540	......
6	......	......	3370	5400	17200	27800	14200	4720	2730	3200	3540	......
7	......	......	4510	4940	18700	30600	12600	3910	2880	3040	3720	......
8	......	......	4300	4720	20700	34400	13400	4100	3200	2880	3720	......
9	......	......	4720	4720	20700	39000	12600	3910	3040	3370	3540	......
10	......	......	4100	4720	20700	42200	11800	3720	4300	3200	3370	......
11	......	......	3910	5400	18700	46200	12200	3720	6630	3370	3200	......
12	......	......	3720	6130	16200	51100	12600	3540	6880	3540	3200	......
13	......	......	7140	7670	14600	54500	12600	3540	6130	3040	3370	......
14	......	......	6130	8510	15000	55400	12200	3910	5170	2880	3370	......
15	......	......	4510	9100	17700	56200	11800	4300	4940	3200	3370	......
16	......	......	3910	8800	20200	53600	10500	4300	4300	3200	3370	......
17	......	......	3540	7940	24600	51100	9900	4300	4100	2880	3200	......
18	......	......	3540	6880	26500	47800	9400	3370	4100	3040	2880	......
19	......	......	3540	5880	28500	46200	8800	2880	3910	3200	3200	......
20	......	3370	3370	5400	27200	41400	8220	2580	3720	3200	3200	......
21	......	2880	3370	5170	28500	40600	7940	2440	3540	3540	3200	......
22	......	2730	3540	4510	25800	39800	7670	2300	3540	3540	3200	......
23	......	2880	3540	4720	26500	41400	7140	2300	3200	3200	3200	......
24	......	3370	3540	5400	32100	39800	7400	2300	3910	3370	3200	......
25	......	3370	3910	6380	31600	38200	7140	2170	3910	3720	2880	......
26	......	3200	4510	7670	31100	32800	6130	2170	3720	3910	3040	......
27	......	3040	4720	9100	30600	29200	5640	2040	3540	3720	3200	......
28	......	2880	5170	9100	28500	26500	5400	1800	3720	3540	3540	......
29	......	......	5400	8220	27200	23400	5170	1690	3540	3370	3220	......
30	......	......	4940	7670	25800	19700	4510	1800	3540	3540	3540	......
31	......	......	4940	....	24600	....	4100	1800	....	3540	....	......
Total	......	......	126010	192600	674610	1121500	320260	97140	112750	103250	100850	......
Mean....	......	......	4060	6420	21800	37400	10300	3130	3760	3330	3360	......
Max......	......	......	7140	9100	32100	56200	18700	4720	6880	3910	3720	......
Min.......	......	......	2580	4510	8510	19700	4100	1690	1800	2880	2880	......
Acre-ft.	......	......	250000	382000	1340000	2230000	633000	192000	224000	205000	200000	......

Unless otherwise noted, all discharges are in cubic feet per second.

FRASER RIVER NEAR ARROW

Location.—In Sec. 4, T. 2 S., R. 75 W., ¼ mile from Vasquez Siding; 1½ miles southwest of Arrow.

Records Available.—September 23, 1910, to November 1, 1918.

Drainage Area.—28 square miles.

Gage.—Friez automatic gage on left bank. Prior to June 3, 1916, vertical staff gage located one mile upstream.

Discharge Measurements.—Made from log bridge and by wading.

Channel.—Probably permanent.

Diversions.—There is a court decree for the diversion of 53 second-feet from the headwaters of this stream across the divide to the Clear Creek basin.

Accuracy.—Records are considered good.

Co-operation.—Station maintained by the United States Geological Survey, by whom the records are furnished.

WILLIAMS FORK NEAR PARSHALL.

Location.—On highway bridge at Field's ranch, 4 miles above the mouth of the river, about Sec. 36, T. 1 N., R. 79 W. Nearest tributary is Battle Creek, which enters from the west 2 miles below the station.

Records Available.—July 25, 1904, to December 31, 1918.

Drainage Area.—185 square miles.

Gage.—Vertical staff; location and datum unchanged.

Channel.—Shifting after high water.

Discharge Measurements.—Made from bridge to which the gage is attached.

Winter Flow.—The main channel is kept open by springs, but ice forms along the edges and slush ice frequently forms. The morning readings are usually affected by backwater from ice, but the afternoon readings are practically unaffected.

Diversions.—There are court decrees for diversion of 558 second-feet from Williams Fork between this station and the one near Scholl, and 25 second-feet from tributaries. There is also a storage decree for 80,700 and 1,420 acre-feet from Williams Fork.

Accuracy.—Conditions are favorable for accurate results, and the estimates should be reliable.

Co-operation.—Station maintained in co-operation with the United States Geological Survey.

Discharge of Fraser River near Arrow for 1917.

Drainage Area, 28 Square Miles. Altitude, 9,500 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7	5	6	6	18	42	254	73	29	15	......	......
2	7	4	6	6	14	46	232	66	28	14	......	......
3	9	5	5	5	16	52	210	62	27	14	......	......
4	7	6	6	5	19	62	206	62	25	14	......	......
5	9	6	6	6	13	67	201	54	24	14	......	......
6	8	5	6	6	12	59	195	51	26	14	......	......
7	7	8	5	6	11	66	197	46	28	14	......	......
8	9	8	6	7	11	87	193	46	24	13	......	......
9	9	9	6	8	11	121	178	45	20	13	......	......
10	9	8	6	6	15	170	180	44	18	13	......	......
11	9	7	6	6	18	182	168	42	20	13	......	......
12	7	6	7	5	22	188	155	45	18	13	......	......
13	7	6	5	6	23	230	145	42	17	12	......	......
14	7	6	6	8	24	234	137	43	21	12	......	......
15	7	5	6	8	29	261	122	42	17	12	......	8
16	6	5	6	7	80	270	106	45	17	12	......	8
17	6	6	6	8	88	286	100	46	16	13	......	9
18	7	6	6	11	84	306	94	47	16	13	......	10
19	7	5	6	6	88	302	104	48	16	13	......	10
20	9	5	7	5	15	283	100	49	16	13	......	11
21	7	6	7	7	16	293	91	50	15	13	......	10
22	7	6	6	11	18	316	85	51	15	13	......	10
23	7	6	5	18	22	320	94	52	15	13	......	9
24	6	7	5	16	26	311	89	46	15	13	......	9
25	7	6	5	14	30	311	109	42	15	......	......	8
26	9	6	5	20	34	311	117	43	16	......	......	8
27	7	6	6	21	41	297	102	37	16	......	......	8
28	7	6	6	17	42	286	98	34	16	......	......	8
29	7	......	6	16	42	283	92	32	16	......	......	9
30	6	......	6	16	43	276	85	30	15	......	......	10
31	6	......	5	......	43	......	80	29	......	......	......	10
Total	229	170	181	287	968	6318	4319	1444	577	316	......	155
Mean	7.4	6.1	5.8	9.6	31.2	211	139	46.6	19.2	13.2	......	9.1
Max	9	9	7	21	43	320	254	73	29	15	......	11
Min	6	4	5	5	11	42	80	29	15	12	......	8
Acre-ft.	455	339	357	571	1920	12600	8550	2870	1140	628	......	307

Discharge of Fraser River near Arrow for 1918.

Drainage Area, 28 Square Miles. Altitude, 9,500 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	10	6	6	27	41	171	161	45	24	19	38	......
2	9	6	6	28	46	151	151	46	26	19	......	......
3	8	6	6	27	54	156	144	46	28	19	......	......
4	8	6	6	26	58	171	137	47	28	19	......	......
5	7	6	6	27	58	185	133	50	27	19	......	......
6	6	6	6	28	66	226	131	45	27	20	......	......
7	6	6	7	28	71	272	120	40	25	21	......	......
8	6	6	6	29	62	339	111	37	23	22	......	......
9	6	6	6	31	61	339	105	37	23	24	......	......
10	6	6	6	31	68	411	105	37	23	25	......	......
11	6	6	6	33	74	491	103	37	24	25	......	......
12	6	6	6	33	80	555	94	36	24	24	......	......
13	6	6	6	33	86	600	96	36	25	24	......	......
14	6	6	6	33	93	622	96	36	25	24	......	......
15	6	6	6	31	127	534	96	36	26	24	......	......
16	6	6	11	31	139	511	103	35	27	27	......	......
17	6	6	20	30	152	534	107	35	26	28	......	......
18	6	6	20	30	159	491	94	35	24	26	......	......
19	6	6	20	29	129	450	89	35	22	23	......	......
20	6	6	20	29	131	450	84	34	20	23	......	......
21	6	6	22	29	140	450	84	32	18	22	......	......
22	6	6	22	30	146	411	84	31	18	21	......	......
23	6	6	23	29	179	374	78	30	15	21	......	......
24	6	6	23	30	196	339	73	29	19	24	......	......
25	6	6	22	28	199	305	70	29	23	23	......	......
26	6	6	22	28	199	272	66	28	22	25	......	......
27	6	6	22	29	199	232	62	27	22	36	......	......
28	6	6	22	35	199	208	54	28	21	36	......	......
29	6	......	21	37	193	192	52	26	20	38	......	......
30	6	......	22	39	193	176	50	25	19	37	......	......
31	6	......	20	......	176	......	48	24	......	41	......	......
Total	198	168	423	908	3774	10618	2981	1090	694	779	......	......
Mean	6.4	6.0	13.6	30.3	122	354	96.2	353	23.1	25.1	......	......
Max	10	6	23	39	199	622	161	50	28	41	......	......
Min	6	6	6	26	41	151	48	24	15	19	......	......
Acre-ft.	394	333	836	1800	7500	21100	5920	2170	1370	1540	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Williams Fork River Near Parshall for 1917.
Drainage Area, 185 Square Miles. Altitude, 7,800 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	56	34	40	66	89	266	1200	238	94	76	78	65
2	57	32	40	64	88	285	1000	206	85	80	92	57
3	58	34	40	57	88	270	1000	192	85	80	100	57
4	59	36	42	61	89	331	950	178	80	78	100	45
5	59	40	44	64	86	475	950	178	85	83	96	45
6	59	38	42	61	103	440	905	178	81	70	86	45
7	59	34	44	64	86	375	950	178	85	73	78	45
8	58	34	44	68	83	427	950	166	85	71	71	51
9	57	38	43	71	77	750	860	146	85	67	68	57
10	56	40	43	61	71	940	815	142	80	70	60	57
11	52	45	45	56	98	1010	770	139	74	73	68	57
12	50	45	45	66	98	1020	770	153	83	67	76	57
13	50	45	45	80	142	1140	730	178	83	68	71	57
14	52	45	45	61	248	1210	690	178	81	70	68	57
15	54	45	45	66	388	1340	650	178	80	68	73	57
16	57	45	45	52	475	1410	575	151	81	73	70	57
17	59	45	45	74	630	1470	508	151	86	74	70	57
18	54	44	45	91	630	1690	475	148	85	80	86	57
19	50	45	45	73	630	1470	415	153	76	78	80	57
20	50	45	45	83	510	1420	388	153	74	74	85	57
21	50	44	45	89	382	1420	388	144	80	74	85	57
22	50	44	45	175	326	1360	360	119	78	74	80	57
23	56	44	45	195	320	1420	360	112	71	74	64	57
24	56	42	45	225	320	1420	315	110	68	81	68	57
25	53	44	44	234	353	1360	315	104	71	85	78	57
26	50	43	44	234	331	1360	295	106	74	86	70	57
27	45	40	46	225	252	1470	275	126	78	81	71	57
28	40	40	52	169	218	1300	275	135	71	90	85	57
29	40	......	44	118	195	1200	275	121	74	98	74	57
30	36	......	56	114	188	1250	275	117	78	80	68	57
31	36	......	60	......	342	......	256	104	......	92	......	57
Total	1618	1151	1398	3117	7936	31299	18940	4682	2391	2378	2319	1721
Mean	52.2	41.1	45.1	104	256	1040	611	151	79.7	76.7	77.3	55.5
Max	59	45	60	234	630	1690	1200	238	94	98	100	65
Min	36	32	40	52	71	266	256	104	68	67	64	45
Acre-ft	3210	2280	2770	6190	15700	61900	37600	9280	4740	4720	4600	3410

Discharge of Williams Fork River Near Parshall for 1918.
Drainage Area, 185 Square Miles. Altitude, 7,800 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	57	45	45	81	112	690	712	148	86	106	86	......
2	64	45	45	86	117	540	674	151	88	110	90	......
3	60	45	45	90	139	610	674	146	86	110	88	......
4	57	45	45	98	203	690	706	146	96	98	94	......
5	57	45	44	90	291	690	642	153	108	96	98	......
6	57	45	44	85	388	770	582	156	85	94	92	......
7	57	51	45	81	382	905	540	148	85	90	94	......
8	57	52	45	92	356	1050	494	142	85	86	92	......
9	51	51	55	92	393	1150	508	128	94	88	98	......
10	45	51	57	81	427	1050	421	126	102	94	85	......
11	25	51	56	78	315	1300	398	126	104	96	106	......
12	35	45	47	100	238	1360	393	123	102	85	88	......
13	45	45	45	117	216	950	346	119	96	96	86	......
14	45	45	45	135	320	2520	338	115	92	90	86	......
15	45	45	45	108	275	2600	328	110	98	92	86	......
16	45	45	45	94	371	2600	324	108	104	88	94	......
17	51	45	45	85	488	2600	328	108	94	86	98	......
18	45	45	45	90	488	2520	320	115	90	86	94	......
19	45	45	46	81	482	1300	303	102	86	85	70	......
20	45	45	55	102	488	1360	268	98	86	85	68	......
21	51	45	93	85	488	1300	253	92	85	88	......	......
22	51	45	56	74	494	1580	242	88	86	88	......	......
23	45	45	56	83	540	1360	238	86	106	86	......	......
24	45	46	60	80	650	1420	228	85	110	88	......	......
25	51	55	61	80	730	1420	225	83	121	92	......	......
26	51	45	67	85	730	1470	216	81	112	90	......	......
27	51	44	96	128	690	1250	200	81	121	90	......	......
28	51	45	88	92	730	1150	189	81	119	85	......	......
29	51	......	85	100	690	950	178	80	110	86	......	......
30	45	......	88	86	730	860	170	83	112	85	......	......
31	35	......	74	......	730	......	158	81	......	81	......	......
Total	1515	1301	1768	2759	13691	40015	11596	3489	2949	2820	......	......
Mean	48.9	46.5	57	92	442	1330	374	113	98.3	91.0	......	......
Max	64	55	96	135	730	2600	712	156	121	110	......	......
Min	25	44	44	74	112	540	158	80	85	81	......	......
Acre-ft	3010	2580	3500	5470	27200	79100	23000	6950	5850	5600	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

BLUE RIVER AT DILLON

Location.—At the cemetery bridge on the outskirts of Dillon, in Sec. 18, T. 5 S., R. 77 W., on the edge of the Leadville National Forest, a short distance above the mouth of Snake River. Ten-Mile Creek also enters below the station.

Records Available.—October 15, 1910, to November 30, 1918.

Drainage Area.—110 square miles.

Gage.—Vertical staff; location and datum unchanged.

Channel.—Practically permanent.

Discharge Measurements.—Made by wading near by and from bridge.

Winter Flow.—Ice causes backwater during the winter and discharge measurements are made to determine the flow.

Diversions.—There are court decrees for diversions of 2.3 second-feet from Blue River above the station and 63 second-feet below, exclusive of a decree for 350 second-feet for the Green Mountain Canal. There is an unadjudicated diversion from the headwaters of the Blue across Boreas Pass to Tarryall Creek. There are also decrees for diversions of 5 second-feet from tributaries entering above. In addition, there are decrees for placer mining, where practically all of the water used is returned to the river.

Accuracy.—Records considered reliable.

Co-operation.—Records furnished by the United States Geological Survey.

SNAKE RIVER AT DILLON

Location.—At a highway bridge 200 yards above the mouth of the river in Sec. 18, T. 5 S., R. 77 W. Nearest tributary is a small stream that enters from the north 1 mile above station.

Records Available.—October 15, 1910, to May 31, 1918.

Drainage Area.—92 square miles.

Gage.—Vertical staff; location and datum unchanged.

Channel.—Practically permanent.

Discharge Measurements.—Made from the bridge and by wading.

Winter Flow.—Ice gorging causes backwater of varying amount.

Diversions.—There are court decrees for diversions of 4.5 second-feet from Snake River above the station and 11 second-feet from tributaries entering above. The Summit County Power Company diverts about 30 second-feet around the station.

Accuracy.—Records reliable.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of Blue River at Dillon for 1917.

Drainage Area, 110 Square Miles. Altitude, 8,815 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	40	37	23	76	78	225	650	236	84	53	46	34
2	40	36	23	73	80	208	600	217	81	51	46	32
3	40	36	23	68	76	245	578	200	78	49	44	32
4	40	36	23	70	81	285	578	187	75	49	44	31
5	40	36	23	80	73	305	532	181	75	49	43	30
6	40	36	23	32	78	305	488	170	76	49	42	28
7	40	34	23	25	78	305	488	167	78	49	37	28
8	40	33	24	39	73	345	650	152	78	49	36	28
9	40	33	25	86	73	458	650	150	72	49	36	28
10	40	31	25	80	75	592	600	148	66	49	36	28
11	42	31	24	70	80	690	532	138	64	49	36	28
12	40	31	23	68	83	690	465	138	61	49	36	28
13	40	30	23	39	106	690	465	138	58	49	36	28
14	40	30	23	42	170	740	442	135	58	49	36	29
15	40	30	23	42	265	740	420	132	58	49	35	30
16	39	28	25	32	325	900	398	138	53	49	34	30
17	39	26	27	46	345	850	355	132	53	49	34	30
18	39	27	25	64	390	900	335	135	53	49	33	31
19	37	27	35	49	390	900	335	138	53	46	32	32
20	36	28	36	49	390	850	335	138	53	45	34	32
21	36	30	45	41	325	800	315	138	53	46	35	32
22	36	30	46	66	265	800	315	115	53	46	36	32
23	36	28	51	86	265	800	315	115	53	46	36	31
24	36	27	69	80	285	750	315	106	53	46	36	30
25	34	26	27	108	265	750	315	104	53	46	35	29
26	39	25	47	131	245	700	335	95	53	46	34	30
27	39	25	46	116	245	800	315	93	53	46	32	30
28	39	24	47	111	225	700	295	98	53	46	32	30
29	39	......	64	88	225	700	295	98	53	46	32	30
30	39	......	81	84	225	700	275	95	53	46	33	30
31	39	......	69	......	225	......	255	87	......	46	34	30
Total	1204	851	1091	2041	6104	18723	13261	4314	1857	1485	1099	931
Mean......	38.8	30.4	35.2	68.0	197	624	428	139	61.9	47.9	36.6	30.0
Max.	42	37	81	131	390	900	650	236	84	53	46	34
Min.........	34	24	23	25	73	208	255	87	53	45	32	28
Acre-ft...	2390	1690	2160	4050	12100	37100	26300	8550	3680	2950	2180	1840

Discharge of Blue River at Dillon for 1918.

Drainage Area, 110 Square Miles. Altitude, 8,815 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	30	24	20	34	170	578	442	158	60	60	47	......
2	30	24	21	34	200	625	420	158	60	60	49	......
3	30	25	21	34	217	625	375	158	63	60	49	......
4	30	27	21	33	217	675	355	158	70	60	49	......
5	30	28	22	32	217	675	355	158	73	60	47	......
6	30	29	22	34	236	750	355	150	73	55	47	......
7	30	29	22	42	255	800	355	145	73	55	47	......
8	30	30	22	43	236	750	355	132	73	55	47	......
9	30	30	22	46	217	750	375	132	73	55	47	......
10	27	30	22	52	236	800	355	132	70	55	47	......
11	24	29	22	55	236	850	355	132	66	55	47	......
12	24	28	22	60	255	850	355	132	66	55	47	......
13	24	28	22	63	335	850	355	132	66	55	47	......
14	24	28	22	60	335	850	355	132	66	55	47	......
15	24	28	21	58	375	850	335	121	66	52	47	......
16	24	28	21	60	420	900	315	121	66	50	47	......
17	25	27	22	55	420	850	315	121	66	50	47	......
18	25	27	22	50	465	850	295	117	66	50	47	......
19	25	27	24	44	465	750	275	110	60	50	47	......
20	26	26	26	46	510	800	275	97	60	50	47	......
21	26	26	26	46	578	850	255	89	60	50	47	......
22	26	25	25	52	555	800	236	89	60	50	47	......
23	26	24	24	50	600	800	221	79	60	50	47	......
24	27	24	25	58	600	800	210	72	60	50	47	......
25	28	23	26	63	600	750	204	70	60	50	47	......
26	28	22	27	60	600	650	178	66	60	50	47	......
27	26	21	28	60	555	600	172	63	60	50	47	......
28	26	20	30	81	578	532	172	63	60	49	47	......
29	25	......	31	108	600	488	172	61	60	49	47	......
30	24	......	32	142	600	488	172	61	60	47	47	......
31	24	......	34	......	600	......	172	60	......	46	......	......
Total..	828	737	747	1655	12483	22186	9136	3469	1936	1644	1416	......
Mean......	26.7	26.3	24.1	55.2	403	740	295	112	64.5	53.0	47.2	......
Max.	30	30	34	142	600	900	442	158	73	60	49	......
Min.........	24	20	20	32	170	488	172	60	60	46	47	......
Acre-ft...	1640	1460	1480	3280	24800	44000	18100	6890	3840	3260	2810	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Snake River at Dillon for 1917.

Drainage Area, 92 Square Miles. Altitude, 8,815 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15	12	13	12	46	60	540	111	24	13	14	......
2	14	12	13	12	50	58	430	100	23	13	14	......
3	14	13	13	12	45	70	380	92	21	13	14	......
4	13	14	13	12	38	94	380	81	20	13	14	......
5	14	14	13	12	38	103	355	76	21	13	14	......
6	14	15	12	12	39	96	355	76	24	13	20	......
7	14	15	12	12	38	83	285	72	24	13	23	......
8	14	14	12	12	39	109	355	68	24	13	29	......
9	14	13	12	17	43	196	405	70	20	13	23	......
10	14	15	12	16	46	330	430	76	18	13	25	......
11	14	16	12	16	46	355	380	74	16	13	25	......
12	14	14	12	17	47	380	285	74	16	13	23	......
13	14	14	13	22	55	405	254	69	16	13	22	......
14	14	14	13	22	69	485	232	64	16	13	21	......
15	14	14	12	20	105	540	220	66	16	13	13	......
16	13	14	12	25	107	690	200	64	16	13	16	......
17	13	14	9	44	116	720	186	63	16	13	20	......
18	13	14	12	52	128	720	179	62	16	12	33	......
19	13	16	12	39	128	720	179	58	16	14	28	......
20	14	14	11	35	126	630	179	62	14	16	28	......
21	14	14	12	35	81	600	162	55	14	14	52	......
22	13	14	11	55	79	720	153	47	14	14	30	......
23	14	14	14	76	83	660	159	44	14	14	26	......
24	13	14	12	72	79	750	172	39	14	14	27	......
25	13	14	13	51	79	630	182	38	14	14	14	......
26	14	13	13	58	72	690	182	33	13	14	13	......
27	14	12	14	53	68	600	159	35	13	14	13	......
28	14	14	14	47	68	600	150	37	13	14	10	......
29	14	......	12	45	66	600	134	33	13	14	10	......
30	14	......	12	45	58	570	136	29	13	14	10	......
31	13	......	12	......	58	......	128	26	......	14	......	......
Total	426	390	382	958	2140	13264	7926	1894	510	417	624	......
Mean	13.7	13.9	12.3	31.9	69.0	442	256	61.1	17.0	13.5	20.8	11.8
Max.	15	16	14	76	128	750	540	111	24	16	52	......
Min.	13	12	9	12	38	58	128	26	13	12	10	......
Acre-ft.	842	772	756	1900	4240	26300	15700	3760	1010	830	1240	726

Discharge of Snake River at Dillon for 1918.

Drainage Area, 92 Square Miles. Altitude, 8,815 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	9	15	12	47	......	......	......	......	......	......	......
2	......	9	18	12	47	......	......	......	......	......	......	......
3	......	9	20	12	51	......	......	......	......	......	......	......
4	......	10	21	11	57	......	......	......	......	......	......	......
5	......	10	23	12	60	......	......	......	......	......	......	......
6	......	10	23	12	72	......	......	......	......	......	......	......
7	......	11	23	12	64	......	......	......	......	......	......	......
8	......	11	21	13	72	......	......	......	......	......	......	......
9	......	10	22	17	76	......	......	......	......	......	......	......
10	......	10	24	18	81	......	......	......	......	......	......	......
11	......	12	20	23	81	......	......	......	......	......	......	......
12	......	10	16	23	86	......	......	......	......	......	......	......
13	......	11	14	26	94	......	......	......	......	......	......	......
14	......	10	11	12	124	......	......	......	......	......	......	......
15	......	10	12	13	131	......	......	......	......	......	......	......
16	......	10	12	16	142	......	......	......	......	......	......	......
17	......	10	13	17	159	......	......	......	......	......	......	......
18	......	11	14	14	159	......	......	......	......	......	......	......
19	......	10	13	14	165	......	......	......	......	......	......	......
20	......	10	12	16	182	......	......	......	......	......	......	......
21	......	13	12	16	220	......	......	......	......	......	......	......
22	......	10	12	18	240	......	......	......	......	......	......	......
23	......	10	11	21	276	......	......	......	......	......	......	......
24	......	11	11	19	262	......	......	......	......	......	......	......
25	......	11	12	21	262	......	......	......	......	......	......	......
26	......	11	12	21	249	......	......	......	......	......	......	......
27	......	11	11	21	232	......	......	......	......	......	......	......
28	......	11	12	28	220	......	......	......	......	......	......	......
29	......	......	12	31	249	......	......	......	......	......	......	......
30	......	......	12	43	240	......	......	......	......	......	......	......
31	......	......	12	......	208	......	......	......	......	......	......	......
Total	......	291	476	544	4608	......	......	......	......	......	......	......
Mean	10.2	10.4	15.4	18.1	149	......	......	......	......	......	......	......
Max.	......	13	24	43	276	......	......	......	......	......	......	......
Min.	......	9	11	11	47	......	......	......	......	......	......	......
Acre.-ft.	627	578	947	1080	9160	......	......	......	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

TEN-MILE CREEK AT DILLON

Location.—At the highway bridge in Dillon, in Sec. 18, T. 5 S., R. 77 W., 300 yards above the mouth of the creek. Nearest tributary, Canon Creek, enters from the west about 4 miles above the station.

Records Available.—October 15, 1910, to November 27, 1918.

Drainage Area.—113 square miles.

Gage.—Vertical staff; location and datum unchanged.

Channel.—Practically permanent.

Discharge Measurements.—Made by wading and from bridge.

Winter Flow.—Ice causes backwater during the winter months, and discharge measurements are made to determine the flow during that period.

Diversions.—There are court decrees for diversions of 11 second-feet from Ten-Mile Creek above the station and 14.5 second-feet from tributaries entering above.

Accuracy.—Records considered reliable.

Co-operation.—Records furnished by the United States Geological Survey.

EAGLE RIVER AT RED CLIFF

Location.—In Sec. 29, T. 6 S., R. 80 W., in the town of Red Cliff, in the Holy Cross National Forest, 100 yards above mouth of Turkey Creek, and 1 mile above the mouth of Homestake Creek.

Records Available.—January 8, 1911, to November 30, 1918.

Drainage Area.—74 square miles.

Gage.—Chain gage; location and datum unchanged.

Channel.—Slightly shifting.

Discharge Measurements.—Made from highway bridge at 800 feet above during high water and by wading at ordinary stages.

Winter Flow.—Little, if any, ice forms at this station.

Diversions.—There are court decrees for diversions of 22 second-feet from Eagle River and tributaries above the station; 18.5 second-feet of this amount for diversion to the Arkansas Basin.

Accuracy.—Records considered good.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of Ten-Mile Creek at Dillon for 1917.

Drainage Area, 113 Square Miles. Altitude, 8,815 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	32	27	19	27	87	177	865	151	54	40	30
2	32	23	18	26	81	194	670	135	51	40	31
3	32	22	18	27	70	308	632	127	50	40	31
4	32	21	19	27	70	422	595	118	50	40	30
5	32	21	19	28	73	390	560	121	50	40	30
6	32	21	20	28	73	302	490	118	52	40	30
7	32	21	20	28	73	330	490	105	52	40	30
8	32	21	20	28	75	525	622	101	52	40	31
9	32	21	19	29	75	825	622	96	50	40	33
10	32	21	19	32	85	1060	595	98	50	40	32
11	31	20	19	28	79	985	490	93	50	40	33
12	29	20	18	27	87	985	455	87	50	40	33
13	27	19	18	34	105	1020	390	87	50	40	34
14	25	19	18	34	185	1140	390	93	50	40	35
15	25	19	18	34	319	1230	330	93	50	40	39
16	27	19	18	31	455	1400	297	98	50	40	34
17	28	19	18	37	560	1230	292	89	50	40	32
18	32	19	18	43	560	1230	270	85	48	40	30
19	33	20	18	44	455	1230	265	91	44	35	29
20	33	20	18	45	422	1060	265	81	41	35	29
21	33	20	18	40	319	985	225	79	40	34	31
22	33	20	17	55	216	1140	225	73	40	34	32
23	32	21	17	79	207	1140	240	66	40	34	32
24	32	21	18	77	212	1230	230	64	40	34	32
25	31	21	19	108	212	1060	225	60	40	34	32
26	32	21	20	124	212	1060	245	58	40	34	29
27	32	21	20	115	207	985	225	58	40	34	29
28	32	20	22	103	190	985	212	66	40	34	29
29	31	......	28	101	181	945	194	66	40	32	29
30	29	......	28	89	181	945	181	59	40	29	29
31	28	......	28	......	177	......	170	55	......	30	......
Total..	955	578	607	1528	6303	26518	11957	2771	1394	1153	940
Mean......	30.8	20.6	19.6	50.9	203	884	386	89.4	46.5	37.2	31.3
Max.......	33	27	28	124	560	1400	865	151	54	40	39
Min.........	25	19	17	26	70	177	170	55	40	29	29
Acre-ft...	1890	1140	1210	3030	12500	52600	23700	5500	2770	2290	1860

Discharge of Ten-Mile Creek at Dillon for 1918.

Drainage Area, 113 Square Miles. Altitude, 8,815 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	23	14	18	42	138	525	442	110	44	66	50
2	23	14	22	40	174	610	410	98	48	66	48
3	23	14	23	46	203	761	378	98	50	66	48
4	23	13	23	40	203	921	348	98	52	66	48
5	22	12	24	37	203	1060	319	98	56	66	48
6	22	12	25	37	181	1190	302	98	64	52	48
7	20	10	26	40	174	1250	302	87	64	52	48
8	20	10	25	40	216	1300	265	87	64	52	48
9	19	10	24	44	216	1360	292	77	56	52	48
10	18	9	24	50	216	1530	280	77	56	52	48
11	18	8	24	56	225	1530	302	75	56	52	48
12	18	8	23	59	235	1480	348	75	56	52	48
13	18	6	23	68	319	1480	336	73	56	52	48
14	18	4	23	71	342	1480	319	73	56	52	48
15	18	2	22	68	378	1480	280	71	56	50	48
16	18	2	21	59	390	1480	265	71	56	48	48
17	18	2	21	50	442	1400	240	70	56	48	48
18	19	4	21	44	490	1400	230	70	56	48	48
19	19	4	22	46	539	1320	216	68	56	48	48
20	19	2	24	54	632	1320	194	68	56	48	48
21	19	4	23	59	730	1190	194	59	56	48	48
22	18	6	23	59	809	1190	174	59	56	48	48
23	18	11	23	68	865	1060	155	54	56	48	48
24	17	12	25	59	889	985	138	51	56	48	48
25	16	13	27	64	921	785	124	50	56	48	48
26	16	14	29	59	889	595	118	50	60	48	48
27	18	15	31	56	825	560	110	50	64	50	48
28	17	16	33	68	785	595	110	44	64	50	......
29	16	......	32	96	632	560	110	44	64	50	......
30	16	......	34	115	610	525	110	44	64	51	......
31	15	......	40	......	560	......	110	44	......	52	......
Total..	582	251	778	1694	14431	32922	7521	2191	1710	1629	1298
Mean......	18.8	9.0	25.1	56.5	466	1100	243	70.7	57.0	52.5	48.1
Max.	23	16	40	115	921	1530	442	110	64	66	50
Min.........	15	2	18	37	138	525	110	44	44	48	48
Acre-ft...	1160	500	1540	3360	28700	65500	14900	4350	3390	3230	2570

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Eagle River at Red Cliff for 1917.

Drainage Area, 74 Square Miles. Altitude, 8,598 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17	14	13	23	69	168	220	49	21	15	12	10
2	17	14	14	19	81	168	193	42	20	17	12	12
3	17	15	14	17	73	187	193	40	20	15	13	15
4	17	16	13	18	60	206	180	39	19	15	16	11
5	16	16	13	13	60	364	168	35	17	16	16	11
6	16	15	15	20	59	260	168	31	20	15	16	15
7	17	14	15	16	58	246	168	28	20	15	16	14
8	19	16	15	23	58	333	168	26	19	15	16	14
9	16	17	15	30	55	427	168	28	20	15	15	15
10	13	17	14	37	52	496	156	30	20	14	14	15
11	15	16	14	37	55	565	144	29	17	14	14	16
12	15	17	14	45	69	530	122	30	18	13	14	16
13	15	16	15	60	96	565	122	31	17	13	15	10
14	15	16	16	92	122	565	106	29	19	5	14	11
15	16	15	15	70	168	565	96	27	17	1	14	13
16	16	15	14	48	206	635	87	26	17	1	14	14
17	16	16	16	53	303	618	85	30	17	2	14	14
18	15	15	16	55	288	600	81	29	17	5	11	13
19	15	15	17	52	303	565	69	28	16	13	8	13
20	16	16	16	43	236	530	85	26	15	7	12	13
21	16	15	16	77	168	478	71	26	16	8	10	13
22	16	16	16	110	168	460	70	22	16	10	11	14
23	16	14	14	144	156	427	69	21	16	10	11	14
24	15	14	15	122	168	396	73	20	15	10	12	14
25	14	14	15	110	168	364	69	21	16	10	14	14
26	16	15	15	114	168	348	80	21	16	12	15	13
27	15	14	16	133	168	303	72	21	16	9	15	13
28	14	12	18	102	168	274	65	27	15	9	9	14
29	14	......	22	82	168	274	62	24	15	10	12	14
30	14	......	24	63	180	246	59	23	15	14	15	12
31	14	......	27	......	193	......	55	21	......	13	......	9
Total..	483	425	492	1828	4344	12163	3524	880	522	341	400	409
Mean......	15.6	15.2	15.9	60.9	140	405	114	28.4	17.4	11.0	13.3	13.2
Max.	19	17	27	144	303	635	220	49	21	17	16	16
Min.......	13	12	13	13	52	168	55	20	15	1	8	9
Acre-ft...	959	844	978	3620	8610	24100	7010	1750	1040	676	791	812

Discharge of Eagle River at Red Cliff for 1918.

Drainage Area, 74 Square Miles. Altitude, 8,598 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11	15	11	43	81	319	186	38	26	25	24	......
2	13	16	12	52	94	326	162	34	27	25	24	......
3	12	15	14	52	94	334	162	34	28	26	23	......
4	14	14	16	55	196	434	162	34	31	26	22	......
5	14	14	17	36	221	478	151	35	34	25	24	......
6	14	14	16	26	246	454	140	37	34	24	22	......
7	13	15	16	26	201	501	131	34	32	24	22	......
8	15	12	16	27	211	535	122	32	35	24	22	......
9	15	11	15	40	238	583	129	32	38	24	22	......
10	15	12	15	58	243	631	118	32	41	26	20	......
11	16	12	14	63	211	597	129	32	35	25	19	......
12	17	11	14	94	190	597	122	32	31	24	21	......
13	18	11	15	80	168	590	136	29	28	24	21	......
14	18	11	16	76	203	566	122	28	26	24	21	......
15	18	11	13	73	232	508	108	30	28	25	22	......
16	18	11	13	65	324	470	114	27	29	25	19	......
17	19	10	13	50	386	421	114	27	28	25	20	......
18	19	10	13	45	450	383	94	26	26	26	20	......
19	19	10	17	42	447	352	70	26	26	26	21	......
20	20	10	17	31	444	337	65	26	24	26	21	......
21	20	11	15	33	437	328	64	26	25	26	16	......
22	20	12	15	36	427	346	62	26	24	26	6	......
23	17	12	16	36	488	342	56	26	24	25	5	......
24	17	11	18	37	638	337	52	26	29	26	8	......
25	17	10	21	41	677	280	52	26	31	27	10	......
26	17	10	27	52	635	260	47	26	30	26	10	......
27	16	10	35	58	593	244	40	26	26	27	10	......
28	16	10	31	55	583	217	44	26	24	28	13	......
29	16	......	28	52	539	207	44	26	24	27	16	......
30	16	......	35	59	457	196	38	28	24	20	16	......
31	16	......	38	......	368	......	......	24	......	22	......	......
Total..	506	331	572	1493	10722	12173	3078	911	868	779	540	......
Mean......	16.3	11.8	18.5	49.8	346	406	99.3	29.4	28.9	25.1	18.0	......
Max.	20	16	38	94	677	631	186	38	41	28	24	......
Min.......	11	10	11	26	81	196	38	24	24	20	5	......
Acre-ft...	1000	655	1140	2960	21300	24200	6110	1810	1720	1540	1070	......

Unless otherwise noted, all discharges are in cubic feet per second.

EAGLE RIVER AT EAGLE

Location.—At the highway bridge at Eagle, in Eagle County, three-fourths of a mile above the mouth of Brush Creek.

Records Available.—March 12, 1905, to February 10, 1907, at site a short distance below the mouth of Brush Creek; January 17, 1911, to November 19, 1918.

Drainage Area.—630 square miles.

Gage.—Chain gage.

Channel.—Practically permanent.

Discharge Measurements.—Made from highway bridge at ordinary and high stages and by wading during low water.

Winter Flow.—Ice causes backwater during the winter. Discharge measurements are made to determine the winter flow.

Diversions.—Between Eagle and the station at Red Cliff there are court decrees for diversions of 380 second-feet from Eagle River, of which 300 second-feet is for power, and for diversions of 286 second-feet from intervening tributaries. Between Eagle and the mouth there are decrees for 22 second-feet from Eagle River.

Accuracy.—Records considered good.

Co-operation.—Records furnished by the United States Geological Survey.

HOME STAKE CREEK NEAR RED CLIFF

Location.—In Sec. 30, T. 6 S., R. 80 W., one-fourth mile above the mouth of the creek and three-fourths of a mile from Red Cliff; below all tributaries.

Records Available.—January 8, 1911, to September 30, 1918.

Drainage Area.—64 square miles.

Gage.—Vertical staff.

Channel.—Apparently permanent.

Discharge Measurements.—Made by wading near by.

Winter Flow.—Ice causes backwater, and discharge measurements are made to determine the winter flow.

Diversions.—There are court decrees for diversions of 1.2 second-feet from Homestake Creek.

Accuracy.—Records considered good.

Co-operation.—Records furnished by the United States Geological Survey.

TURKEY CREEK AT RED CLIFF

Location.—At highway bridge in Red Cliff, 800 feet above the mouth of the creek.

Records Available.—June 30, 1913, to March 31, 1918.

Drainage Area.—27 square miles.

Gage.—Vertical staff.

Discharge Measurements.—Made from single span bridge, and by wading.

Winter Flow.—Ice causes backwater during the winter months, and discharge measurements are made to determine the flow.

Accuracy.—Records considered good.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of Eagle River at Eagle for 1917.

Drainage Area, 630 Square Miles. Altitude, 6,558 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	163	485	988	4480	785	261	221	175	......
2	......	......	......	143	608	1120	4060	785	261	221	180	......
3	......	......	......	163	748	1310	3920	710	261	221	182	......
4	......	......	......	142	710	1860	3500	640	301	190	182	......
5	......	......	......	147	485	2220	3240	640	301	190	182	......
6	......	......	......	180	428	1980	2850	575	301	190	180	......
7	......	......	......	149	428	1980	2720	575	301	190	180	......
8	......	......	......	175	545	2220	2980	575	301	190	178	......
9	......	......	......	231	380	2980	2850	515	301	190	178	......
10	......	......	......	375	455	4060	2720	515	301	165	175	......
11	......	......	......	273	428	4620	2720	455	341	165	175	......
12	......	......	......	250	485	4060	2590	455	341	165	172	......
13	......	......	......	355	575	3780	2340	515	341	165	170	......
14	......	......	......	310	825	4620	2220	515	390	165	168	......
15	......	......	......	336	1310	5740	2100	455	390	165	165	......
16	......	......	......	297	1740	6020	1860	455	390	165	165	......
17	......	......	......	301	2220	6300	1740	455	341	165	161	......
18	......	......	......	250	2590	6300	1740	455	297	165	161	......
19	......	......	......	332	2460	6300	1620	455	297	163	161	......
20	......	......	......	370	2340	6020	1510	455	257	165	158	......
21	......	......	......	281	2100	5180	1510	455	254	163	158	......
22	......	......	......	428	1510	4620	1510	350	254	163	158	......
23	......	......	......	640	1510	5320	1410	350	217	163	156	......
24	......	......	......	675	1510	5320	1310	305	254	165	156	......
25	......	......	......	710	1410	5320	1210	305	254	165	156	......
26	......	......	......	675	1310	5460	1120	305	254	165	156	......
27	......	......	133	785	1310	5320	1030	305	217	163	154	......
28	......	......	142	710	1080	5040	1030	305	217	165	154	......
29	......	......	182	675	1080	4760	945	305	217	168	152	......
30	......	......	217	545	1620	4760	945	305	217	170	152	......
31	......	......	201	......	1310	....	865	305	......	172	......	......
Total	......	......	875	11066	35995	125578	66645	14580	8630	5438	5000	......
Mean....	......	......	175	369	1160	4190	2150	470	288	175	167	......
Max......	......	......	217	785	2590	6300	4480	785	390	221	182	......
Min.......	......	......	133	142	380	988	865	305	217	163	152	......
Acre-ft.	......	......	1740	22000	71300	249000	132000	28900	17100	10800	9940	......

Discharge of Eagle River at Eagle for 1918.

Drainage Area, 630 Square Miles. Altitude, 6,558 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	314	455	2220	2800	375	165	208	156	......
2	......	......	......	336	575	1980	2580	350	165	201	156	......
3	......	......	......	360	640	2590	2360	332	161	195	152	......
4	......	......	......	370	710	3110	2140	341	161	201	152	......
5	......	......	......	281	1410	3240	1930	375	161	195	156	......
6	......	......	......	268	1510	3370	1720	400	165	195	156	......
7	......	......	......	255	1620	4060	1510	400	165	190	152	......
8	......	......	......	242	1740	4340	1310	400	195	190	156	......
9	......	......	......	273	1980	4760	1210	375	265	195	156	......
10	......	......	......	350	1740	5040	1210	341	400	195	156	......
11	......	......	......	370	1410	5880	1210	332	455	201	152	......
12	......	......	......	485	1510	6300	1210	314	455	208	156	......
13	......	......	......	608	1860	6160	1210	305	428	208	156	......
14	......	......	......	575	1980	6300	1120	289	400	201	156	......
15	......	......	......	575	1980	6160	1030	281	400	195	156	......
16	......	......	......	455	2220	5600	988	273	428	190	156	......
17	......	......	143	390	2340	5460	945	227	341	185	156	......
18	......	......	161	360	2590	5040	905	221	305	180	156	......
19	......	......	170	350	2460	4760	785	214	273	175	152	......
20	......	......	192	242	2460	4620	748	208	242	175	152	......
21	......	......	175	227	2460	5040	710	208	214	170	......	......
22	......	......	175	250	2590	5180	608	201	208	170	......	......
23	......	......	182	297	2850	5040	575	190	195	170	......	......
24	......	......	195	341	3240	5040	575	180	201	165	......	......
25	......	......	208	360	3370	4900	545	180	265	161	......	......
26	......	......	231	455	3240	4620	515	175	235	161	......	......
27	......	......	277	575	3110	4220	515	175	221	161	......	......
28	......	......	269	485	3240	3920	455	175	195	156	......	......
29	......	......	235	455	2980	3240	428	170	201	161	......	......
30	......	......	265	400	2720	3020	400	170	208	161	......	......
31	......	......	281	......	2460	....	375	165	......	156	......	......
Total	......	......	3159	11304	65450	135190	34622	8342	7873	5675	3096	......
Mean....	......	......	211	377	2110	4510	1120	269	262	183	155	......
Max......	......	......	281	608	3370	6300	2800	400	455	208	156	......
Min.......	......	......	143	227	455	1980	375	165	161	156	152	......
Acre-ft.	......	......	6280	22400	130000	268000	68900	16500	15600	11300	6150	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Homestake Creek near Red Cliff for 1917.

Drainage Area, 64 Square Miles. Altitude, 8,598 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	19	64	130	500	90	25	14	16	......
2	......	......	......	19	80	128	480	74	23	13	16	......
3	......	......	......	19	62	130	460	68	21	13	18	......
4	......	......	......	19	63	200	450	65	19	12	20	......
5	......	......	......	19	64	440	430	63	20	12	22	......
6	......	......	......	19	62	310	420	63	21	12	19	......
7	......	......	......	19	61	270	368	62	23	11	20	......
8	......	......	......	19	60	310	350	61	24	11	22	......
9	......	......	......	19	58	368	330	60	24	10	22	......
10	......	......	......	19	56	385	310	60	24	10	24	......
11	......	......	......	22	54	600	288	60	24	10	22	......
12	22	......	......	35	80	500	260	59	24	10	20	......
13	......	......	......	50	130	520	250	59	25	10	18	......
14	......	......	......	100	190	390	220	58	28	10	15	......
15	......	......	......	50	250	304	200	56	33	10	15	......
16	......	......	......	45	304	368	180	54	25	10	15	......
17	......	......	......	45	319	700	172	52	22	9	14	......
18	......	......	......	48	330	730	174	49	20	9	14	......
19	......	......	......	45	335	750	178	46	19	8	14	......
20	22	......	......	40	300	750	180	43	18	11	14	......
21	......	......	......	60	250	740	178	40	18	11	14	......
22	......	......	......	90	220	730	175	37	17	10	13	......
23	......	......	......	116	194	730	174	34	17	10	13	......
24	......	......	......	100	208	670	172	30	16	9	13	......
25	......	......	......	96	202	620	185	26	16	9	13	......
26	......	......	......	100	190	608	206	28	15	8	12	......
27	......	......	......	120	150	590	183	30	15	8	12	......
28	......	......	......	90	102	570	160	32	14	9	12	......
29	......	......	......	70	111	540	140	30	14	10	10	......
30	......	......	......	60	130	520	125	29	14	12	10	......
31	......	......	......	......	150	......	111	27	......	14	......	......
Total	......	......	......	1572	4829	14801	8009	1545	618	325	482	......
Mean	......	......	......	52.4	156	493	258	49.8	20.6	10.5	16.1	......
Max	......	......	......	120	335	750	500	90	33	14	24	......
Min	......	......	......	19	54	128	111	26	14	8	10	......
Acre-ft.	......	......	......	3120	9590	29300	15900	3060	1230	646	958	......

Discharge of Homestake Creek near Red Cliff for 1918.

Drainage Area, 64 Square Miles. Altitude, 8,598 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	45	65	190	320	50	16	......	......	......
2	......	......	......	50	75	190	300	48	17	......	......	......
3	......	......	......	54	85	360	280	70	17	......	......	......
4	......	......	......	56	90	542	260	80	18	......	......	......
5	......	......	......	54	100	600	240	70	20	......	......	......
6	......	......	......	52	224	650	220	64	25	......	......	......
7	......	......	......	50	240	700	200	62	50	......	......	......
8	......	......	......	45	250	750	180	62	75	......	......	......
9	......	......	......	50	200	780	161	61	86	......	......	......
10	......	......	......	60	190	850	161	61	90	......	......	......
11	......	......	......	70	144	900	156	50	100	......	......	......
12	......	......	......	80	148	900	152	38	80	......	......	......
13	......	......	......	87	150	900	148	35	66	......	......	......
14	......	......	......	75	152	900	144	32	61	......	......	......
15	......	......	......	70	200	850	140	30	56	......	......	......
16	......	......	......	65	250	820	136	30	51	......	......	......
17	......	......	......	60	290	800	128	30	48	......	......	......
18	......	......	......	55	320	790	120	30	44	......	......	......
19	......	......	......	50	350	780	112	30	40	......	......	......
20	......	......	......	40	380	770	104	22	36	......	......	......
21	......	......	......	36	415	800	96	20	32	......	......	......
22	......	......	......	38	445	1000	90	20	28	......	......	......
23	......	......	......	40	475	1200	86	17	23	......	......	......
24	......	......	......	42	510	1300	82	16	50	......	......	......
25	......	5.6	......	44	542	740	78	16	75	......	......	......
26	8.5	......	......	50	500	580	74	16	66	......	......	......
27	......	......	......	65	450	500	70	15	46	......	......	......
28	......	......	......	60	400	400	66	15	40	......	......	......
29	......	......	......	60	350	363	64	16	40	......	......	......
30	......	......	36	60	300	340	61	16	42	......	......	......
31	......	......	38	......	250	......	55	16	......	......	......	......
Total	......	......	......	1663	8540	21245	4484	1138	1438	......	......	......
Mean	......	......	......	55.4	275	708	145	36.7	47.9	......	......	......
Max	......	......	......	87	542	1300	320	80	100	......	......	......
Min	......	......	......	36	65	190	55	15	16	......	......	......
Acre-ft.	......	......	......	3300	16900	42100	8920	2260	2850	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Turkey Creek at Red Cliff for 1917.

Drainage Area, 27 Square Miles. Altitude, 8,598 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.4	4.4	4.8	6.6	16	35	204	18	8.9	4.6	4.4	4.0
2	6.1	4.6	4.4	7.0	12	39	183	18	8.6	4.6	4.5	4.1
3	5.8	4.5	4.6	5.2	13	60	169	18	8.3	4.0	4.6	4.2
4	5.5	4.5	4.5	6.6	16	80	149	17	8.0	4.2	4.7	4.0
5	5.2	4.4	4.4	8.6	16	79	129	16	7.8	4.2	4.8	4.0
6	5.2	4.4	4.4	4.8	14	80	122	16	7.8	4.0	7.0	4.0
7	4.6	4.4	4.4	5.6	12	79	116	16	8.0	4.0	6.5	4.0
8	4.0	4.2	4.8	7.0	13	89	98	14	7.8	4.0	6.0	4.0
9	4.2	4.8	4.6	8.3	12	129	79	14	7.7	3.9	6.4	4.0
10	4.6	4.4	4.5	8.6	12	163	68	15	7.6	3.9	7.2	4.0
11	4.8	4.6	4.5	9.2	12	197	67	14	7.2	4.0	6.8	4.0
12	5.0	4.8	4.4	9.5	13	211	67	14	7.2	4.2	4.8	4.0
13	4.8	5.0	4.8	10.0	22	240	64	14	7.4	4.0	5.2	4.2
14	4.8	4.6	4.8	12.0	32	255	55	13	7.6	4.0	5.2	3.8
15	4.4	4.6	4.4	11.0	33	255	49	13	7.6	3.9	5.2	4.4
16	4.8	4.4	4.4	9.5	59	270	43	13	7.0	4.3	4.4	4.3
17	4.8	4.4	4.4	11.0	75	293	42	12	6.4	4.7	4.0	4.2
18	4.8	4.4	4.6	11.0	90	316	39	12	6.2	5.0	4.0	4.0
19	4.6	4.4	4.8	11.0	93	300	39	12	5.8	5.4	4.1	4.0
20	5.2	4.4	4.2	9.5	74	316	38	11	5.4	3.9	4.2	4.0
21	4.4	4.6	7.4	15.0	55	316	36	11	5.8	3.9	4.0	3.9
22	4.6	5.6	4.2	21.0	44	300	32	11	5.8	3.9	4.0	4.0
23	4.4	4.4	7.4	27.0	36	316	27	11	5.7	4.2	4.0	4.2
24	4.0	4.5	6.2	27.0	37	286	36	11	5.6	3.9	4.0	4.4
25	4.4	4.7	5.8	25.0	41	255	30	10	5.4	4.0	4.3	4.4
26	4.2	4.8	5.4	24.0	45	270	26	10	5.2	3.9	4.6	4.4
27	4.4	4.4	7.0	20.0	40	255	26	10	5.2	3.9	4.2	4.4
28	4.4	4.8	5.8	18.0	36	240	25	11	5.2	4.0	4.2	4.4
29	4.4	......	7.6	16.0	31	225	24	10	5.2	4.1	4.3	4.4
30	4.2	......	8.0	14.0	34	225	23	10	5.2	4.2	4.4	4.4
31	4.8	......	6.2	......	37	......	19	10	......	4.4	......	4.4
Total	147.8	128.0	161.7	379.0	1075	6174	2125	405	202.6	129.2	146.0	128.5
Mean....	4.77	4.57	5.22	12.6	34.7	206	68.5	13.1	6.75	4.17	4.87	4.15
Max......	6.4	5.6	8.0	27	93	316	204	18	8.9	5.4	7.2	4.4
Min.......	4.0	4.2	4.2	4.8	12	35	19	10	5.2	3.9	4.0	3.8
Acre-ft.	293	254	321	750	2130	12300	4210	806	402	256	290	255

Discharge of Turkey Creek at Red Cliff for 1918.

Drainage Area, 27 Square Miles. Altitude, 8,598 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.4	4.0	4.6	......	......	......	......	......	......	......	......	......
2	4.4	4.2	4.6	......	......	......	......	......	......	......	......	......
3	4.4	4.2	4.6	......	......	......	......	......	......	......	......	......
4	4.2	4.2	4.6	......	......	......	......	......	......	......	......	......
5	4.4	4.2	4.6	......	......	......	......	......	......	......	......	......
6	4.4	4.2	4.6	......	......	......	......	......	......	......	......	......
7	4.4	4.4	5.0	......	......	......	......	......	......	......	......	......
8	4.2	4.4	5.0	......	......	......	......	......	......	......	......	......
9	4.2	4.2	4.9	......	......	......	......	......	......	......	......	......
10	4.0	4.2	4.9	......	......	......	......	......	......	......	......	......
11	4.2	4.2	4.8	......	......	......	......	......	......	......	......	......
12	4.4	4.2	4.8	......	......	......	......	......	......	......	......	......
13	4.3	4.2	6.0	......	......	......	......	......	......	......	......	......
14	4.2	4.2	7.2	......	......	......	......	......	......	......	......	......
15	4.2	4.2	5.0	......	......	......	......	......	......	......	......	......
16	4.2	4.2	4.6	......	......	......	......	......	......	......	......	......
17	4.4	4.2	5.0	......	......	......	......	......	......	......	......	......
18	4.4	4.2	5.4	......	......	......	......	......	......	......	......	......
19	4.4	4.6	5.4	......	......	......	......	......	......	......	......	......
20	4.3	4.4	4.6	......	......	......	......	......	......	......	......	......
21	4.2	4.2	7.2	......	......	......	......	......	......	......	......	......
22	4.2	5.0	5.6	......	......	......	......	......	......	......	......	......
23	4.2	5.0	6.6	......	......	......	......	......	......	......	......	......
24	4.2	5.0	7.0	......	......	......	......	......	......	......	......	......
25	4.2	5.0	7.4	......	......	......	......	......	......	......	......	......
26	4.2	4.2	8.9	......	......	......	......	......	......	......	......	......
27	4.2	4.2	8.9	......	......	......	......	......	......	......	......	......
28	4.2	4.2	7.6	......	......	......	......	......	......	......	......	......
29	3.9	......	8.3	......	......	......	......	......	......	......	......	......
30	4.2	......	9.5	......	......	......	......	......	......	......	......	......
31	4.2	......	10.0	......	......	......	......	......	......	......	......	......
Total	131.9	121.6	187.0	......	......	......	......	......	......	......	......	......
Mean....	4.25	4.34	6.03	......	......	......	......	......	......	......	......	......
Max......	4.4	5.0	10	......	......	......	......	......	......	......	......	......
Min.......	3.9	4.0	4.6	......	......	......	......	......	......	......	......	......
Acre-ft.	261	241	371	......	......	......	......	......	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

ROARING FORK AT ASPEN

Location.—At the bridge near the old power plant at Aspen, above Castle, Maroon and Hunter Creeks.

Records Available.—January 1, 1911, to April 30, 1918.

Drainage Area.—109 square miles.

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge Measurements.—Made by wading, except during high water, when bridge is used.

Winter Flow.—Ice causes backwater during the winter; discharge measurements are made to determine the winter flow.

Diversions.—The Salvation ditch, which has a decree for 58 second-feet, diverts water above the station usually from the middle of May to the middle of September.

Accuracy.—Results are reliable.

Co-operation.—Records furnished by the United States Geological Survey.

ROARING FORK BELOW ASPEN

Location.—In Sec. 1, T. 10 S., R. 85 W., two miles below Aspen at the first highway bridge. Nearest tributary above is Castle Creek, and below, Maroon Creek.

Records Available.—October 18, 1913, to June 30, 1918.

Drainage Area.—223 square miles.

Gage.—Vertical staff.

Control.—Shifts slightly at high water.

Discharge Measurements.—Made from two-span bridge.

Winter Flow.—Ice causes little or no backwater during the winter months, as shown by discharge measurements.

Diversions.—Between the station at Aspen and this one there are a number of small diversions, some of which return the water to the river above this station. The Roaring Fork Light and Power Company diverts water from Maroon Creek into Castle Creek, and thence into Roaring Fork above the station.

Accuracy.—Results considered reliable.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of Roaring Fork River at Aspen for 1917.

Drainage Area, 109 Square Miles. Altitude, 7,931 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	44	41	19	42	62	148	1440	290	76	55	60	50
2	51	38	28	47	67	137	1370	240	70	62	56	49
3	43	39	25	45	59	188	1180	225	65	49	56	51
4	49	47	28	34	61	322	1180	200	61	56	54	43
5	44	40	43	29	60	440	1120	200	59	54	55	53
6	41	47	28	43	60	272	1060	188	61	54	54	54
7	66	36	32	27	62	342	885	175	74	56	54	49
8	57	38	39	40	61	462	885	148	63	56	54	47
9	59	42	34	41	76	775	1000	146	63	54	49	51
10	61	41	34	36	72	1180	940	146	61	50	49	50
11	61	34	38	44	60	1180	885	164	62	47	45	47
12	44	44	38	50	67	1060	940	142	70	45	49	47
13	36	45	40	55	89	1240	725	164	65	45	47	43
14	45	40	34	53	123	1440	675	146	82	44	54	47
15	51	39	36	42	175	1630	625	152	71	44	50	49
16	56	51	44	57	255	1700	552	131	70	45	54	40
17	57	34	32	45	380	1910	485	125	66	48	54	44
18	47	39	55	41	380	2050	462	116	61	40	54	42
19	56	35	45	42	552	1980	485	109	59	44	54	47
20	62	38	50	49	380	1840	530	110	59	48	56	44
21	42	47	59	43	272	1700	462	98	60	45	53	40
22	40	43	25	92	240	1700	420	94	59	48	49	40
23	44	50	21	95	200	1770	380	88	59	44	51	44
24	43	43	23	105	200	1700	440	102	56	48	49	43
25	39	45	47	112	200	1770	400	98	55	50	49	39
26	43	40	32	97	212	1840	775	98	63	47	49	41
27	39	23	40	88	137	1700	530	98	62	50	47	38
28	52	32	44	80	129	1630	400	105	61	59	39	39
29	47	......	49	54	139	1560	325	88	57	54	50	39
30	51	......	54	50	131	1630	360	79	54	57	49	38
31	41	......	55	......	146	......	342	74	......	55	......	35
Total	1501	1131	1171	1687	5107	37296	22258	4339	1904	1553	1543	1383
Mean	48.4	40.4	37.8	56.2	165	1240	718	140	63.5	50.1	51.4	44.6
Max	66	51	59	112	552	2050	1440	290	82	62	60	54
Min	36	23	19	27	59	137	325	74	54	40	39	35
Acre-ft.	2980	2240	2320	3340	10100	73800	44100	8610	3780	3080	3060	2740

Discharge of Roaring Fork at Aspen for 1918

Drainage Area, 109 Square Miles. Altitude, 7,931 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34	36	41	54	......	......	......	......	......	......	......	......
2	38	42	42	61	......	......	......	......	......	......	......	......
3	41	40	44	63	......	......	......	......	......	......	......	......
4	40	38	42	56	......	......	......	......	......	......	......	......
5	39	41	39	36	......	......	......	......	......	......	......	......
6	38	39	45	47	......	......	......	......	......	......	......	......
7	41	40	34	47	......	......	......	......	......	......	......	......
8	38	43	41	49	......	......	......	......	......	......	......	......
9	38	47	36	53	......	......	......	......	......	......	......	......
10	38	43	35	65	......	......	......	......	......	......	......	......
11	31	42	38	71	......	......	......	......	......	......	......	......
12	39	40	36	83	......	......	......	......	......	......	......	......
13	42	40	33	83	......	......	......	......	......	......	......	......
14	42	38	35	86	......	......	......	......	......	......	......	......
15	43	35	36	79	......	......	......	......	......	......	......	......
16	40	41	45	68	......	......	......	......	......	......	......	......
17	41	44	44	66	......	......	......	......	......	......	......	......
18	38	38	43	63	......	......	......	......	......	......	......	......
19	40	33	40	61	......	......	......	......	......	......	......	......
20	38	35	41	63	......	......	......	......	......	......	......	......
21	40	35	41	55	......	......	......	......	......	......	......	......
22	42	36	41	62	......	......	......	......	......	......	......	......
23	41	38	42	61	......	......	......	......	......	......	......	......
24	36	43	42	62	......	......	......	......	......	......	......	......
25	41	39	41	72	......	......	......	......	......	......	......	......
26	42	40	42	74	......	......	......	......	......	......	......	......
27	43	38	47	79	......	......	......	......	......	......	......	......
28	41	39	41	75	......	......	......	......	......	......	......	......
29	38	......	42	61	......	......	......	......	......	......	......	......
30	41	......	45	65	......	......	......	......	......	......	......	......
31	40	......	54	......	......	......	......	......	......	......	......	......
Total	1224	1103	1268	1920	......	......	......	......	......	......	......	......
Mean	39.5	39.4	40.9	64.0	......	......	......	......	......	......	......	......
Max.	43	47	54	86	......	......	......	......	......	......	......	......
Min	31	33	33	36	......	......	......	......	......	......	......	......
Acre-ft.	2430	2190	2510	3810	......	......	......	......	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Roaring Fork River Below Aspen for 1917.
Drainage Area, 109 Square Miles. Altitude, 7,931 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	148	127	104	106	182	370	2690	660	278	414	194	145
2	154	125	106	104	180	387	2080	610	255	350	193	140
3	160	123	109	108	178	430	1920	540	232	300	192	132
4	154	125	111	112	181	490	1760	495	220	250	184	131
5	160	128	115	114	184	755	1640	495	222	200	177	130
6	169	126	110	118	176	640	1480	495	225	220	180	127
7	185	123	106	109	169	760	1350	495	230	240	183	126
8	183	120	110	109	169	900	1400	480	223	260	186	136
9	180	116	112	109	169	1070	1460	470	217	287	189	146
10	170	114	111	109	169	1250	1570	450	217	250	192	158
11	135	112	114	120	190	1250	1400	440	217	221	192	151
12	128	118	118	135	208	1120	1280	428	235	190	192	151
13	115	109	123	128	240	1600	1130	414	238	161	192	151
14	123	115	128	135	297	2220	1040	414	242	169	192	151
15	128	120	132	128	360	2300	1000	415	236	165	174	151
16	128	128	134	140	480	2370	945	420	232	162	154	151
17	127	123	135	135	620	2540	890	425	225	159	155	151
18	123	123	140	132	760	2780	860	414	223	156	156	151
19	126	123	118	135	755	2880	830	400	220	152	158	151
20	128	123	140	142	755	2880	830	387	218	148	161	148
21	128	124	110	118	755	2860	800	350	215	150	162	144
22	128	124	108	185	468	2860	820	320	214	155	164	138
23	128	122	108	200	430	2860	830	287	213	155	166	138
24	128	118	114	245	400	2880	830	298	214	158	169	138
25	128	116	120	275	380	2920	840	305	217	161	166	138
26	128	114	104	269	362	2960	1200	315	222	165	164	138
27	128	107	109	234	350	2690	960	325	224	169	161	138
28	128	105	114	251	340	2640	720	313	224	172	160	138
29	128	......	114	180	350	2620	720	307	225	184	155	138
30	132	......	114	184	355	2690	720	290	225	196	154	130
31	130	......	114	......	362	......	720	280	......	195	......	126
Total	4338	3351	3605	4569	10974	56972	36715	12737	6768	6313	5217	4359
Mean....	140	120	116	152	354	1900	1180	411	226	204	174	141
Max.....	185	128	140	275	760	2960	2690	660	278	414	194	158
Min......	115	105	104	104	169	370	720	280	213	148	154	126
Acre-ft.	8610	6660	7130	9040	21800	113000	72600	25300	13400	12500	10400	8670

Discharge of Roaring Fork Below Aspen for 1918.
Drainage Area, 109 Square Miles. Altitude, 7,931 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	135	106	115	141	217	785	......	......	......	......	......	......
2	141	114	116	177	230	800	......	......	......	......	......	......
3	139	117	117	180	320	1100	......	......	......	......	......	......
4	137	120	119	170	408	1400	......	......	......	......	......	......
5	135	123	123	160	450	1700	......	......	......	......	......	......
6	138	126	120	154	490	2000	......	......	......	......	......	......
7	141	128	118	156	550	2280	......	......	......	......	......	......
8	138	120	116	158	581	2930	......	......	......	......	......	......
9	133	114	114	161	550	3000	......	......	......	......	......	......
10	130	114	114	180	519	4000	......	......	......	......	......	......
11	125	114	114	198	480	4500	......	......	......	......	......	......
12	123	114	114	216	450	5000	......	......	......	......	......	......
13	130	114	114	217	408	5000	......	......	......	......	......	......
14	141	114	120	210	500	4800	......	......	......	......	......	......
15	141	114	130	205	600	4500	......	......	......	......	......	......
16	141	114	135	200	700	4170	......	......	......	......	......	......
17	141	120	135	190	800	4200	......	......	......	......	......	......
18	141	125	136	180	937	4000	......	......	......	......	......	......
19	141	128	137	175	980	3500	......	......	......	......	......	......
20	130	128	138	177	1020	3450	......	......	......	......	......	......
21	123	128	139	165	1100	3350	......	......	......	......	......	......
22	124	130	140	169	1200	3270	......	......	......	......	......	......
23	126	135	141	172	1400	2800	......	......	......	......	......	......
24	128	130	141	185	1500	2590	......	......	......	......	......	......
25	116	120	141	198	1500	2540	......	......	......	......	......	......
26	106	114	148	212	1350	2490	......	......	......	......	......	......
27	96	114	154	234	1240	2440	......	......	......	......	......	......
28	86	114	152	230	1100	2390	......	......	......	......	......	......
29	76	......	150	226	1000	2330	......	......	......	......	......	......
30	86	......	148	222	900	2280	......	......	......	......	......	......
31	96	......	143	......	800	......	......	......	......	......	......	......
Total	3884	3352	4042	5618	24280	89595	......	......	......	......	......	......
Mean....	125	120	130	187	783	2990	......	......	......	......	......	......
Max.	141	135	154	234	1500	5000	......	......	......	......	......	......
Min.......	76	106	114	141	217	785	......	......	......	......	......	......
Acre-ft.	7690	6660	7990	11100	48100	178000	......	......	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

ROARING FORK AT GLENWOOD SPRINGS

Location.—On bridge 500 feet above the mouth of the river in Glenwood Springs. Nearest important tributary enters about 3 miles above the station.

Records Available.—April 6, 1906, to September 30, 1909; September 21, 1910, to November 30, 1918.

Drainage Area.—1,450 square miles.

Gage.—November 20, 1915, a new slope gage established 800 feet above bridge. Recording gage installed October 27, 1917.

Channel.—Practically permanent, but rough. Extremely high water in Grand River may cause backwater at the gage. Measurements made at stages as high as 5.7 feet on Roaring Fork, and 9.2 feet on Grand River have shown no backwater effect.

Discharge Measurements.—Made from highway bridge.

Winter Flow.—Surface ice rarely forms entirely across the river, but slush and anchor ice frequently occur. Discharge measurements sometimes show backwater from ice.

Diversions.—There are court decrees for diversions of 196 second-feet from Roaring Fork above the station, and 795 second-feet from the various tributaries.

Accuracy.—Conditions are favorable for accurate results; estimates should be reliable.

Co-operation.—Records furnished by the United States Geological Survey.

CASTLE CREEK NEAR ASPEN

Location.—In Sec. 35, T. 10 S., R. 85 W., in the Sopris National Forest, on the highway bridge 4 miles above Aspen. No tributary between the station and the mouth of the creek except small gulches that carry spring run-off. Nearest tributary above, Conundrum Creek, enters one mile upstream.

Records Available.—February 16, 1911, to November 22, 1918.

Drainage Area.—72 square miles.

Gage.—Automatic gage.

Channel.—Slightly shifting.

Discharge Measurements.—Made from car and cable during high water and by wading at low stages.

Winter Flow.—Affected by ice and discharge measurements are made to determine the flow.

Diversions.—No water is diverted above the station. The Roaring Fork Light & Power Co. and the Newman mine divert water from Castle Creek below the station.

Accuracy.—Results considered excellent except for latter part of 1916.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of Roaring Fork at Glenwood Springs for 1917.
Drainage Area, 1,450 Square Miles. Altitude, 5,747 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	532	475	390	690	1450	3030	9640	2860	1010	860	762	568
2	540	475	445	610	1320	2700	9080	2540	1010	910	770	575
3	575	475	390	508	1260	3440	8250	2240	1010	910	770	589
4	540	508	465	540	1260	4180	7980	2240	1010	910	753	547
5	445	540	540	508	1260	4800	7720	1920	910	815	719	561
6	508	527	508	508	1210	3980	7460	1590	1010	815	702	540
7	491	488	475	508	1160	4800	7200	1650	1370	815	678	561
8	475	488	475	639	1210	5620	7200	1710	1160	815	648	508
9	508	475	475	770	1160	6440	7200	1840	1180	815	625	520
10	457	508	488	860	1160	7480	6690	1710	1010	770	603	554
11	508	491	488	770	1380	8520	6440	2100	1010	792	596	520
12	575	475	488	815	1590	7720	6190	1970	1480	815	596	540
13	495	457	475	960	1990	8520	5700	1840	1590	728	589	520
14	502	445	463	960	2390	9080	5400	1840	1420	728	610	554
15	508	445	508	865	4380	10500	5100	1710	1210	728	610	534
16	508	415	488	770	5010	10700	4800	1590	1210	685	610	475
17	540	475	463	575	5160	10900	4590	1590	1210	728	603	475
18	508	445	469	475	5310	11000	4380	1590	1110	728	589	508
19	554	445	475	580	5460	11100	4180	1540	1110	728	561	508
20	540	445	488	685	4720	11100	3980	1480	1110	728	582	501
21	540	445	475	728	3980	11100	4180	1370	1010	728	582	494
22	540	445	463	994	3590	9920	3980	1320	1010	728	589	494
23	575	445	475	1260	3400	10200	3780	1210	1010	728	582	520
24	575	445	475	1480	3590	10500	4590	1280	1010	685	575	508
25	540	462	445	1710	3400	10800	3780	1350	910	696	582	501
26	540	508	445	2540	3030	11100	3980	1410	910	708	589	494
27	495	475	475	1970	2860	11100	3980	1480	910	719	589	494
28	518	415	960	1840	2700	10500	3780	1370	910	728	540	488
29	540	......	728	1710	2860	10500	3680	1210	910	685	568	475
30	475	......	1060	1580	3040	10200	3590	1210	910	685	568	475
31	475	......	770	......	3210	......	3400	1010	910	744	......	......
Total	16122	13137	16227	29408	85500	251530	171900	51770	32640	23657	18740	15601
Mean....	520	469	523	980	2760	8380	5550	1670	1090	763	625	503
Max.	575	540	1060	2540	5460	11100	9640	2860	1590	910	770	589
Min.......	445	415	390	475	1160	2700	3400	1010	910	685	540	475
Acre-ft.	32000	26000	32200	58300	170000	499000	341000	103000	64900	46900	37200	30900

Discharge of Roaring Fork at Glenwood Springs for 1918.
Drainage Area, 1,450 Square Miles. Altitude, 5,747 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	475	433	410	860	1280	3210	4590	1260	685	880	851	......
2	482	439	427	910	1420	3210	4380	1260	728	860	842	......
3	482	482	451	860	1590	4380	4180	1260	728	870	833	......
4	482	463	433	860	2040	5700	4380	1210	815	842	815	......
5	482	469	451	815	2540	6690	4180	1210	960	842	815	......
6	501	463	514	728	3030	7460	3780	1260	1060	833	797	......
7	439	463	514	728	3210	8520	3590	1260	1010	815	762	......
8	508	451	554	685	3030	8800	3400	1210	960	788	719	......
9	514	380	582	728	3030	9920	3400	1160	1110	806	702	......
10	482	400	566	860	2700	11400	3210	1110	1590	910	710	......
11	380	421	625	960	2390	13600	3400	1110	1780	920	719	......
12	385	433	662	1160	2100	14200	3030	1110	1480	880	728	......
13	482	445	920	1240	2100	14900	3030	1110	1370	833	702	......
14	501	410	662	1360	2700	15200	2860	1060	1260	824	710	......
15	508	427	603	1220	3400	14200	2700	1110	1210	806	719	......
16	501	390	540	1080	4380	13900	2540	1060	1160	797	719	......
17	475	439	540	980	4800	13300	2390	1010	1110	815	662	......
18	494	482	540	910	4590	13000	2390	960	1160	815	648	......
19	514	451	575	842	4380	11100	2240	910	1010	806	678	......
20	494	439	540	770	4800	11100	2110	860	1010	788	678	......
21	415	439	540	788	4590	11100	2110	860	960	806	655	......
22	410	433	575	797	4800	11400	1970	815	910	824	655	......
23	463	457	575	860	5460	11400	1840	770	910	824	625	......
24	501	501	610	1010	6190	10800	1840	770	1060	833	640	......
25	514	482	648	1160	5940	9360	1710	770	1060	890	640	......
26	527	390	685	1260	5700	8520	1710	770	1010	842	568	......
27	520	457	770	1420	5010	7720	1590	728	1010	824	554	......
28	488	433	770	1240	5010	6440	1480	728	960	860	603	......
29	469	......	728	1120	4590	5940	1420	728	910	851	603	......
30	488	......	728	1140	3980	5230	1420	685	910	860	568	......
31	494	......	815	......	3590	......	1320	685	......	842	......	......
Total	14870	12372	18555	29351	114370	291700	84170	30809	31796	25986	20920	......
Mean....	480	442	599	978	3690	9720	2720	994	1060	838	697	......
Max.	527	501	920	1420	6190	15200	4590	1260	1780	920	851	......
Min.......	380	380	410	685	1280	3210	1320	685	685	788	554	......
Acre.-ft.	29500	24500	36800	58200	227000	578000	167000	61100	63100	51500	41500	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Castle Creek Near Aspen for 1917.

Drainage Area, 72 Square Miles. Altitude, 7,931 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34	26	26	31	43	117	680	236	97	69	52	44
2	34	27	24	33	45	121	656	221	93	70	50	44
3	34	28	24	31	45	144	620	203	91	64	50	45
4	34	29	25	31	44	183	590	199	90	64	50	42
5	34	29	26	31	43	203	558	194	91	62	49	45
6	34	29	26	32	41	194	575	199	95	62	49	45
7	34	29	28	30	43	214	532	188	105	62	49	42
8	34	28	29	31	42	252	540	179	101	62	49	41
9	34	28	29	33	44	335	508	175	98	61	48	44
10	34	27	29	33	46	408	500	179	95	60	48	45
11	32	26	28	33	53	402	495	181	111	60	48	44
12	30	26	28	34	60	425	428	175	126	59	48	45
13	27	26	29	37	77	470	408	186	107	58	48	44
14	29	26	29	37	105	502	450	177	111	58	48	43
15	29	26	28	35	157	550	458	175	101	56	48	42
16	29	25	28	34	190	570	415	172	90	56	48	41
17	29	25	37	34	194	578	382	199	82	56	48	42
18	29	26	35	33	201	562	375	183	79	56	48	42
19	29	27	28	33	188	546	382	168	76	56	48	43
20	29	28	28	33	168	530	352	153	74	58	46	42
21	29	29	27	36	146	492	320	144	73	58	48	41
22	29	29	28	45	132	498	300	134	70	56	46	42
23	29	29	29	48	132	555	332	130	66	55	45	41
24	29	29	30	52	132	600	372	126	60	56	44	41
25	29	29	28	55	130	618	340	121	58	58	44	41
26	29	29	29	56	128	653	465	117	58	58	44	41
27	29	28	30	50	121	752	355	130	63	55	44	41
28	29	26	30	47	123	746	292	126	69	54	43	41
29	29	......	33	46	126	677	282	113	67	50	44	40
30	29	......	34	43	126	612	282	109	64	53	44	41
31	29	......	33	......	121	......	285	109	......	52	......	40
Total	951	769	895	1137	3246	13509	13529	5101	2561	1814	1418	1315
Mean	30.7	27.5	28.9	37.9	105	450	436	165	85.4	58.5	47.3	42.4
Max.	34	29	37	56	201	752	680	236	126	70	52	45
Min.	27	25	24	30	41	117	282	109	58	50	43	40
Acre-ft.	1890	1530	1780	2260	6460	26800	26800	10100	5080	3600	2820	2610

Discharge of Castle Creek Near Aspen for 1918.

Drainage Area, 72 Square Miles. Altitude, 7,931 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	32	37	54	194	362	118	77	......	55	......
2	......	......	33	39	59	199	351	122	81	......	55	......
3	......	......	33	37	69	234	340	127	85	......	54	......
4	......	......	34	37	79	320	334	132	89	......	53	......
5	......	......	35	37	90	420	328	136	87	......	52	......
6	......	......	36	34	100	520	322	149	78	......	51	......
7	......	......	36	34	120	520	316	138	76	......	49	......
8	......	......	36	35	140	540	310	129	72	......	48	......
9	......	......	34	37	130	558	304	121	127	......	46	......
10	......	......	34	39	120	650	298	121	158	......	45	......
11	......	......	34	41	109	750	292	129	143	......	45	......
12	......	......	36	45	105	810	286	123	121	......	45	......
13	......	......	35	46	113	890	280	117	119	......	44	......
14	......	......	33	48	134	890	260	132	110	......	44	......
15	......	......	33	42	164	970	232	129	117	......	43	......
16	......	......	38	41	192	770	222	119	102	......	44	......
17	......	......	33	40	197	710	210	112	94	......	43	......
18	......	......	33	38	181	630	200	104	89	......	47	......
19	......	......	33	35	197	610	190	98	83	......	47	......
20	......	......	33	36	210	610	180	93	80	......	46	......
21	......	......	33	37	205	575	176	93	76	......	44	......
22	......	......	32	37	221	558	165	89	76	......	44	......
23	......	......	33	41	250	540	174	85	78	......	......	......
24	......	......	34	41	280	522	167	83	76	......	......	......
25	......	......	35	45	290	505	160	80	73	......	......	......
26	......	......	37	49	268	505	156	78	70	55	......	......
27	......	......	38	49	248	470	149	80	65	54	......	......
28	......	......	37	45	248	396	147	76	62	55	......	......
29	......	......	36	45	227	365	138	75	62	55	......	......
30	......	......	36	47	210	382	132	73	62	55	......	......
31	......	......	36	......	201	......	114	73	......	55	......	......
Total	......	......	1071	1214	5211	16613	7295	3334	2698	329	1044	......
Mean	32.0	31.5	34.5	40.5	168	554	235	108	89.9	54.8	47.5	......
Max.	......	......	38	49	290	970	362	149	158	55	55	......
Min.	......	......	32	34	54	194	114	73	62	54	43	......
Acre-ft.	1970	1750	2120	2410	10300	33000	14400	6640	5350	652	2070	......

Unless otherwise noted, all discharges are in cubic feet per second.

MAROON CREEK NEAR ASPEN

Location.—In Sec. 22, T. 10 S., R. 85 W., in the Sopris National Forest, just above the headgate of the Roaring Fork Light & Power Co., 5 miles above Aspen, Colo. Nearest tributary, Willow Creek, enters just below the station.

Records Available.—January 1, 1911, to June 2, 1917.

Drainage Area.—42 square miles.

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge Measurements.—Made by wading, except during high water, when they are made from a footbridge.

Winter Flow.—Discharge measurements indicate that ice does not cause backwater at this station.

Diversions.—One or two small diversions above the station; the Roaring Fork Light & Power Co. diverts water just below.

Accuracy.—Estimates made are reliable.

Co-operation.—Records furnished by the United States Geological Survey.

NORTH FORK OF FRYING PAN CREEK NEAR NORRIE

Location.—On a highway bridge in Sec. 21, T. 8 S., R. 83 W., in the Sopris National Forest, about 1 mile from Norrie. No tributaries between the station and the mouth of the creek.

Records Available.—February 18, 1911, to March 31, 1917.

Drainage Area.—42 square miles.

Gage.—Vertical staff.

Channel.—Practically permanent, but rough.

Discharge Measurements.—Made from the bridge during high water and by wading at ordinary stages.

Winter Flow.—Affected by ice.

Diversions.—No water is diverted above the station, so the records represent the natural run-off.

Accuracy.—Owing to the scattering gage heights and the probable error in mean daily stage as determined from one reading, the estimates cannot be considered better than fair.

Co-operation.—Station maintained by the United States Geological Survey in co-operation with the United States Forest Service. Records furnished by the United States Geological Survey.

FRYING PAN CREEK AT NORRIE

Location.—At the highway bridge in Norrie, in Sec. 28, T. 8 S., R. 83 W., in the Sopris National Forest, 1 mile above the entrance of the North Fork.

Records Available.—February 18, 1911, to March 31, 1917.

Drainage Area.—92 square miles.

Gage.—Vertical staff.

Channel.—Slightly shifting after high water.

Discharge Measurements.—Made from the bridge.

Winter Flow.—Ice probably causes backwater during the winter months.

Diversions.—No water is diverted from this creek either above or below the station.

Accuracy.—Records reliable.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of Maroon Creek Near Aspen for 1917.

Drainage Area, 42 Square Miles. Altitude, 8,300 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	38	30	29	28	34	75	......	......	......	......	......	......
2	36	30	29	28	34	71	......	......	......	......	......	......
3	35	31	29	28	34	......	......	......	......	......	......	......
4	34	30	29	28	33	......	......	......	......	......	......	......
5	34	30	29	28	32	......	......	......	......	......	......	......
6	34	30	29	28	32	......	......	......	......	......	......	......
7	34	30	29	28	32	......	......	......	......	......	......	......
8	33	30	28	28	32	......	......	......	......	......	......	......
9	33	29	28	28	32	......	......	......	......	......	......	......
10	33	29	28	29	33	......	......	......	......	......	......	......
11	33	29	28	29	35	......	......	......	......	......	......	......
12	33	29	28	29	38	......	......	......	......	......	......	......
13	33	29	28	29	42	......	......	......	......	......	......	......
14	33	29	28	29	46	......	......	......	......	......	......	......
15	33	29	28	29	51	......	......	......	......	......	......	......
16	33	29	28	29	65	......	......	......	......	......	......	......
17	32	29	28	29	82	......	......	......	......	......	......	......
18	32	29	28	29	86	......	......	......	......	......	......	......
19	32	29	28	29	86	......	......	......	......	......	......	......
20	32	29	28	29	86	......	......	......	......	......	......	......
21	32	29	27	29	86	......	......	......	......	......	......	......
22	32	29	27	31	67	......	......	......	......	......	......	......
23	32	28	27	32	67	......	......	......	......	......	......	......
24	32	28	28	33	69	......	......	......	......	......	......	......
25	32	29	27	35	73	......	......	......	......	......	......	......
26	32	29	27	36	75	......	......	......	......	......	......	......
27	30	29	27	36	75	......	......	......	......	......	......	......
28	30	29	28	36	78	......	......	......	......	......	......	......
29	30	......	28	34	80	......	......	......	......	......	......	......
30	30	......	28	34	80	......	......	......	......	......	......	......
31	30	......	28	......	78	......	......	......	......	......	......	......
Total	1012	819	869	907	1773	......	......	......	......	......	......	......
Mean	32.6	29.2	28.0	30.2	57.2	......	......	......	......	......	......	......
Max.	38	31	29	36	86	......	......	......	......	......	......	......
Min.	30	28	27	28	32	......	......	......	......	......	......	......
Acre-ft.	2000	1620	1720	1800	3520	......	......	......	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of North Fork of Frying Pan River Near Norrie for 1917.
Drainage Area, 42 Square Miles. Altitude, 8,431 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8	7	7	......	......	......	......	......	......	......	......	......
2	8	7	7	......	......	......	......	......	......	......	......	......
3	8	7	7	......	......	......	......	......	......	......	......	......
4	8	7	7	......	......	......	......	......	......	......	......	......
5	8	7	7	......	......	......	......	......	......	......	......	......
6	8	7	7	......	......	......	......	......	......	......	......	......
7	8	7	7	......	......	......	......	......	......	......	......	......
8	8	7	7	......	......	......	......	......	......	......	......	......
9	8	7	6	......	......	......	......	......	......	......	......	......
10	8	7	6	......	......	......	......	......	......	......	......	......
11	8	7	6	......	......	......	......	......	......	......	......	......
12	8	7	6	......	......	......	......	......	......	......	......	......
13	7	7	6	......	......	......	......	......	......	......	......	......
14	7	7	6	......	......	......	......	......	......	......	......	......
15	7	7	6	......	......	......	......	......	......	......	......	......
16	7	7	6	......	......	......	......	......	......	......	......	......
17	7	7	6	......	......	......	......	......	......	......	......	......
18	7	7	6	......	......	......	......	......	......	......	......	......
19	7	7	6	......	......	......	......	......	......	......	......	......
20	7	7	6	......	......	......	......	......	......	......	......	......
21	7	7	6	......	......	......	......	......	......	......	......	......
22	7	7	6	......	......	......	......	......	......	......	......	......
23	7	7	7	......	......	......	......	......	......	......	......	......
24	7	7	7	......	......	......	......	......	......	......	......	......
25	7	7	7	......	......	......	......	......	......	......	......	......
26	7	7	7	......	......	......	......	......	......	......	......	......
27	7	7	7	......	......	......	......	......	......	......	......	......
28	7	7	7	......	......	......	......	......	......	......	......	......
29	7	......	7	......	......	......	......	......	......	......	......	......
30	7	......	8	......	......	......	......	......	......	......	......	......
31	7	......	8	......	......	......	......	......	......	......	......	......
Total	229	196	205	......	......	......	......	......	......	......	......	......
Mean	7.4	7.0	6.6	......	......	......	......	......	......	......	......	......
Max.	8	7	8	......	......	......	......	......	......	......	......	......
Min.	7	7	6	......	......	......	......	......	......	......	......	......
Acre-ft.	455	389	406	......	......	......	......	......	......	......	......	......

Discharge of Frying Pan River at Norrie for 1917.
Drainage Area, 92 Square Miles. Altitude, 8,431 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	26	26	24	......	......	......	......	......	......	......	......	......
2	29	26	22	......	......	......	......	......	......	......	......	......
3	32	26	22	......	......	......	......	......	......	......	......	......
4	32	26	20	......	......	......	......	......	......	......	......	......
5	32	26	18	......	......	......	......	......	......	......	......	......
6	37	26	18	......	......	......	......	......	......	......	......	......
7	34	26	18	......	......	......	......	......	......	......	......	......
8	34	25	20	......	......	......	......	......	......	......	......	......
9	35	24	20	......	......	......	......	......	......	......	......	......
10	32	26	22	......	......	......	......	......	......	......	......	......
11	32	25	21	......	......	......	......	......	......	......	......	......
12	32	24	20	......	......	......	......	......	......	......	......	......
13	32	24	19	......	......	......	......	......	......	......	......	......
14	32	24	18	......	......	......	......	......	......	......	......	......
15	32	22	18	......	......	......	......	......	......	......	......	......
16	32	22	18	......	......	......	......	......	......	......	......	......
17	32	22	18	......	......	......	......	......	......	......	......	......
18	32	23	19	......	......	......	......	......	......	......	......	......
19	28	24	20	......	......	......	......	......	......	......	......	......
20	28	24	22	......	......	......	......	......	......	......	......	......
21	27	23	22	......	......	......	......	......	......	......	......	......
22	26	22	21	......	......	......	......	......	......	......	......	......
23	28	22	20	......	......	......	......	......	......	......	......	......
24	29	22	18	......	......	......	......	......	......	......	......	......
25	28	23	22	......	......	......	......	......	......	......	......	......
26	27	24	26	......	......	......	......	......	......	......	......	......
27	26	25	29	......	......	......	......	......	......	......	......	......
28	26	26	32	......	......	......	......	......	......	......	......	......
29	26	......	37	......	......	......	......	......	......	......	......	......
30	26	......	44	......	......	......	......	......	......	......	......	......
31	26	......	44	......	......	......	......	......	......	......	......	......
Total	930	678	712	......	......	......	......	......	......	......	......	......
Mean	30.0	24.2	23.0	......	......	......	......	......	......	......	......	......
Max.	37	26	44	......	......	......	......	......	......	......	......	......
Min.	26	22	18	......	......	......	......	......	......	......	......	......
Acre-ft.	1840	1340	1410	......	......	......	......	......	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

FRYING PAN CREEK AT THOMASVILLE

Location.—At a private bridge in Sec. 7, T. 8 S., R. 83 W., 1,000 feet S. W. of railroad station. Nearest tributary, Deadman Gulch, enters one-fourth mile below.

Records Available.—January 2, 1911, to November 10, 1918.

Drainage Area.—175 square miles.

Gage.—Vertical staff. Recording gage installed May 5, 1918.

Channel.—Practically permanent, but rough.

Discharge Measurements.—Made from the bridge during high water and by wading at ordinary stages.

Winter Flow.—Ice causes backwater during the winter months, and discharge measurements are made to determine the flow.

Diversions.—As there are no court decrees for diversion of water above the station, it is probable that the records represent the natural run-off from the drainage basin.

Accuracy.—Conditions favorable for fairly accurate determination of discharge; results should be reliable.

Co-operation.—Records furnished by the United States Geological Survey.

CRYSTAL RIVER AT MARBLE

Location.—Near the electric railway bridge of the Colorado Yule Marble Co., in Sec. 26, T. 11 S., R. 88 W., at Marble. Nearest tributary, Carbonate Creek, enters above Marble.

Records Available.—November 1, 1910, to August 18, 1917.

Drainage Area.—77 square miles.

Gage.—A vertical hook gage graduated to hundredths of a foot.

Channel.—Shifts slightly at long intervals.

Discharge Measurements.—Measurements made from car and cable and by wading.

Winter Flow.—Gage heights at this station little, if any, affected by ice.

Diversions.—There are no court decrees for diversions above the station, but for 114 second-feet below Marble.

Accuracy.—Conditions are favorable for fairly accurate results and the estimates are considered reliable.

Co-operation.—The field data are furnished through the courtesy of the Colorado Yule Marble Co. to the United States Geological Survey, from whom records were obtained.

Discharge of Frying Pan River at Thomasville for 1917.

Drainage Area, 175 Square Miles. Altitude, 7,968 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	56	38	42	40	165	1160	2000	252	87	69	44	44
2	56	38	41	39	187	1220	2000	259	84	69	44	44
3	56	36	41	39	198	1440	1940	236	84	69	50	44
4	56	39	40	40	206	1660	1940	268	84	69	50	44
5	56	39	39	42	206	1710	1660	285	84	69	50	56
6	54	39	36	40	221	1600	1710	272	76	69	44	44
7	50	40	36	40	215	1800	1600	236	69	66	44	39
8	46	42	36	39	227	1950	1520	252	69	69	56	44
9	46	39	38	40	227	2000	1440	198	69	62	44	44
10	44	40	36	42	215	2100	1320	206	69	62	50	44
11	44	42	36	43	278	2150	1320	195	62	62	50	39
12	44	42	38	42	236	2200	1160	165	69	62	44	44
13	46	39	36	42	236	2300	1050	141	69	56	44	44
14	50	44	36	46	259	2350	735	116	76	56	34	44
15	46	44	34	44	236	2400	675	110	69	56	39	39
16	44	44	36	50	246	2450	575	120	69	62	39	44
17	44	42	37	49	227	2500	427	120	69	62	39	44
18	44	42	38	46	246	2500	480	120	69	56	44	44
19	44	42	36	46	259	2450	480	141	69	56	30	44
20	44	42	37	43	338	2200	395	141	69	56	44	44
21	44	42	36	46	375	1940	395	141	69	56	44	44
22	46	41	36	50	395	2030	395	130	69	56	44	44
23	44	41	37	54	480	1970	395	120	69	62	44	44
24	42	41	38	56	525	1940	395	120	62	56	46	44
25	44	41	39	50	575	2000	355	101	69	44	44	44
26	40	41	41	44	650	2030	355	105	69	44	44	42
27	40	40	49	50	802	2060	320	105	69	50	44	44
28	44	42	50	61	885	2060	320	101	69	44	44	44
29	44	......	46	56	819	2000	288	92	69	44	39	44
30	42	......	42	44	968	2000	268	92	69	44	39	44
31	42	......	45	......	1160	......	252	84	......	50	......	44
Total	1442	1142	1208	1363	12262	60170	28165	5024	2148	1807	1315	1359
Mean....	46.5	40.8	39.0	45.4	396	2010	909	162	71.6	58.3	43.8	43.8
Max.	56	44	50	61	1160	2500	2000	285	87	69	56	56
Min.......	40	36	34	39	165	1160	252	84	62	44	30	39
Acre-ft.	2860	2270	2400	2700	24300	120000	55900	9960	4260	3580	2610	2690

Discharge of Frying Pan Creek at Thomasville for 1918.

Drainage Area, 175 Square Miles. Altitude, 7,968 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	44	44	43	145	152	......	805	183	79	106	92	......
2	44	44	49	130	194	......	750	178	85	102	96	......
3	44	41	51	134	168	......	695	180	79	102	100	......
4	44	45	53	134	208	......	695	180	98	90	96	......
5	44	49	58	112	194	......	640	178	119	85	92	......
6	39	39	54	119	350	......	575	205	134	81	87	......
7	44	41	58	119	485	......	570	194	130	74	81	......
8	47	44	54	134	485	......	570	175	123	71	78	......
9	44	39	51	152	585	......	560	168	208	74	78	......
10	44	39	51	152	640	......	535	161	338	100	71	......
11	44	41	51	145	440	......	535	168	303	110	......	......
12	44	44	50	156	418	......	510	166	224	96	......	......
13	44	44	58	134	418	......	535	154	170	92	......	......
14	44	41	63	145	440	......	422	145	145	87	......	......
15	47	39	74	130	510	......	438	138	134	81	......	......
16	44	39	83	134	668	......	395	127	141	79	......	......
17	44	39	88	168	695	......	395	119	130	87	......	......
18	44	39	92	141	750	......	372	112	119	81	......	......
19	44	39	87	145	......	......	350	108	108	81	......	......
20	39	41	92	145	......	......	330	104	104	76	......	......
21	39	44	94	141	......	......	330	98	100	78	......	......
22	44	44	88	123	......	......	310	94	92	87	......	......
23	39	40	88	123	......	......	310	90	92	87	......	......
24	39	43	92	145	......	......	292	85	116	83	......	......
25	39	44	94	152	......	......	274	81	130	88	......	......
26	39	49	83	145	......	......	257	79	143	87	......	......
27	39	44	92	163	......	1240	240	79	136	98	......	......
28	38	44	88	134	......	1050	224	78	134	96	......	......
29	39	......	112	141	......	985	208	78	125	94	......	......
30	44	......	123	152	......	925	208	76	112	94	......	......
31	44	......	134	......	......	......	194	76	......	92	......	......
Total	1319	1183	2348	4193	7800	4200	13524	4057	4151	2739	871	......
Mean....	42.6	42.6	75.7	140	433	......	436	131	138	88.4	87.1	......
Max.	47	45	134	168	750	......	805	205	338	110	100	......
Min.......	38	39	43	112	152	......	194	76	79	71	71	......
Acre-ft.	2620	2350	4650	8330	15500	......	26800	8060	8210	5440	1730	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Crystal River at Marble, Colo., for 1917.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	39	42	32	33	54	140	1960	369	......	......	......	......
2	40	26	18	30	56	129	1700	257	......	......	......	......
3	40	28	29	29	58	188	1630	257	......	......	......	......
4	33	30	40	25	56	269	1550	252	......	......	......	......
5	33	28	25	29	49	284	1720	252	......	......	......	......
6	33	25	24	28	51	272	1590	252	......	......	......	......
7	32	33	36	25	52	307	1450	249	......	......	......	......
8	36	32	36	32	55	433	1470	252	......	......	......	......
9	30	29	24	38	50	805	1510	246	......	......	......	......
10	30	28	26	40	55	945	1420	252	......	......	......	......
11	31	29	24	46	60	923	1320	249	......	......	......	......
12	30	29	24	53	61	967	1220	246	......	......	......	......
13	29	29	24	61	80	1180	1160	252	......	......	......	......
14	29	29	24	64	170	1340	1150	246	......	......	......	......
15	29	29	23	49	269	1560	1040	246	......	......	......	......
16	29	29	22	52	316	1670	945	240	......	......	......	......
17	29	28	22	61	355	1650	820	240	......	......	......	......
18	29	28	22	66	400	1720	785	240	......	......	......	......
19	29	22	22	68	416	1750	785	......	......	......	......	......
20	22	25	23	66	362	1500	695	......	......	......	......	......
21	24	26	23	68	246	1600	675	......	......	......	......	......
22	32	26	23	72	213	1730	645	......	......	......	......	......
23	32	27	24	83	200	1780	785	......	......	......	......	......
24	28	27	24	116	188	1810	775	......	......	......	......	......
25	29	24	24	122	193	1910	795	......	......	......	......	......
26	28	26	25	111	176	1940	775	......	......	......	......	......
27	55	27	25	78	154	1960	725	......	......	......	......	......
28	30	38	26	67	148	1950	562	......	......	......	......	......
29	28	......	29	68	161	1960	540	......	......	......	......	......
30	27	......	32	61	170	2110	518	......	......	......	......	......
31	24	......	29	......	154	......	540	......	......	......	......	......
Total	969	799	804	1741	5028	36782	33255	4597	......	......	......	......
Mean	31.3	28.5	25.9	58.0	162	1230	1070	255	......	......	......	......
Max.	55	42	40	122	416	2110	1960	369	......	......	......	......
Min.	22	22	18	25	49	129	517	240	......	......	......	......
Acre-ft.	1920	1580	1590	3450	9960	73200	65800	9100	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

EAST RIVER AT ALMONT

Location.—At highway bridge at Almont, 100 feet above the junction of East and Taylor Rivers.

Records Available.—July 27, 1910, to November 30, 1913; March 7, 1916, to September 30, 1918. A station was maintained at this point from April 15 to October 8, 1905, but the gage was referred to a different datum.

Drainage Area.—295 square miles.

Gage.—Vertical staff.

Channel.—Shifting.

Discharge Measurements.—Made from bridge.

Winter Flow.—Ice causes backwater in varying amounts, but no measurements have been made to determine this.

Diversions.—There are court decrees for diversions of 78 second-feet from East River, above the station, and 52 second-feet from tributaries.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of East River at Almont for 1917.

Drainage Area, 295 Square Miles. Altitude, 8,031 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	75	85	315	745	2060	605	175	120	100	100
2	......	......	75	85	315	745	1710	565	175	120	100	100
3	......	......	75	85	255	905	1600	488	175	120	100	100
4	......	......	75	85	255	1020	1600	488	175	120	100	100
5	......	......	75	85	255	1140	1480	450	175	120	100	100
6	......	......	75	85	285	962	1480	450	175	120	100	75
7	......	......	75	85	315	1080	1250	450	175	120	100	65
8	......	......	75	85	315	1190	1250	415	175	120	100	65
9	......	......	75	85	315	1650	1310	380	175	120	100	56
10	......	......	75	85	415	2170	1360	380	175	120	100	56
11	......	......	75	100	525	2230	1250	450	175	120	100	65
12	......	......	75	132	650	2110	1080	450	175	120	100	65
13	......	......	75	160	745	2520	1080	450	175	120	100	65
14	......	......	75	160	1020	2580	1080	415	175	120	100	65
15	......	......	75	160	1310	2880	1020	380	175	110	100	65
16	......	......	80	145	1420	3240	905	348	175	100	100	65
17	......	......	75	145	1480	3480	1020	315	175	100	100	65
18	......	......	75	145	1600	3540	905	315	175	100	100	70
19	......	......	75	120	1480	3420	745	315	175	100	100	70
20	......	......	75	110	1420	3060	745	285	175	100	100	70
21	......	......	75	132	1250	2940	745	255	175	100	100	70
22	......	......	75	232	1190	2880	745	232	145	100	100	70
23	......	......	80	285	962	2940	695	210	120	100	100	70
24	......	......	75	415	795	2940	745	210	120	100	100	70
25	......	......	85	488	795	3000	850	210	120	100	100	65
26	......	......	85	525	745	3000	905	210	120	110	100	65
27	......	......	85	450	695	2520	795	210	120	100	100	65
28	......	......	85	450	745	2340	650	210	120	100	100	65
29	......	......	85	315	795	2280	605	210	120	100	100	65
30	......	......	85	315	795	2280	650	175	120	100	100	65
31	......	......	85	......	795	......	650	175	......	100	......	65
Total	1641	1871	2405	5834	24252	67787	32965	10701	4780	3400	3000	2217
Mean	52.9	66.8	77.6	194	782	2260	1060	345	159	110	100	71.5
Max.	......	......	85	525	1600	3540	2060	605	175	120	100	100
Min.	......	......	75	85	255	745	605	175	120	100	100	56
Acre-ft.	3250	3710	4770	11500	48100	134000	65200	21200	9460	6760	5950	4400

Discharge of East River at Almont for 1918.

Drainage Area, 295 Square Miles. Altitude, 8,031 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	65	56	70	100	450	1140	962	255	145	......	......	......
2	65	65	70	100	565	1140	905	255	145	......	......	......
3	65	65	70	110	650	1360	850	285	145	......	......	......
4	65	65	70	120	905	1650	795	255	160	......	......	......
5	65	65	75	120	1190	1710	795	255	175	......	......	......
6	65	65	75	120	1480	1820	745	285	192	......	......	......
7	65	65	75	110	1540	2520	745	232	175	......	......	......
8	65	65	75	120	1540	3000	745	232	175	......	......	......
9	65	65	75	120	1360	3250	695	232	210	......	......	......
10	56	65	65	145	1140	3700	650	232	525	......	......	......
11	47	65	70	175	850	4800	650	232	450	......	......	......
12	56	65	75	210	795	5000	565	232	380	......	......	......
13	65	65	75	232	850	5000	605	232	315	......	......	......
14	65	70	80	255	1310	5000	650	232	285	......	......	......
15	65	70	80	255	1480	3700	605	232	255	......	......	......
16	65	70	80	255	1650	3250	565	210	232	......	......	......
17	65	70	80	210	1600	3250	525	210	210	......	......	......
18	65	70	80	175	1600	3000	488	210	210	......	......	......
19	65	70	75	192	1600	2640	450	210	192	......	......	......
20	65	70	75	145	1710	2640	450	210	175	......	......	......
21	65	70	75	175	1600	2640	415	192	175	......	......	......
22	65	75	75	175	1650	2520	415	175	160	......	......	......
23	70	75	75	192	1770	2520	415	175	160	......	......	......
24	75	75	80	255	1770	2060	380	145	160	......	......	......
25	80	75	80	285	1710	1820	380	145	160	......	......	......
26	85	75	80	348	1710	1710	348	145	160	......	......	......
27	80	80	80	415	1540	1540	315	145	160	......	......	......
28	70	80	80	348	1540	1310	255	145	145	......	......	......
29	70	......	85	348	1480	1080	285	145	145	......	......	......
30	65	......	85	415	1360	1080	255	145	145	......	......	......
31	65	......	92	......	1190	......	255	145	......	......	......	......
Total	2054	1931	2377	6225	41585	77850	17158	6430	6321	......	......	......
Mean	66.3	69.0	76.8	208	1340	2600	553	207	211	......	......	......
Max.	85	80	92	415	1770	5000	962	285	525	......	......	......
Min.	47	56	65	100	450	1080	255	145	145	......	......	......
Acre-ft.	4080	3830	4720	12400	82400	155000	34000	12700	6321	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

TAYLOR RIVER AT ALMONT

Location.—At highway bridge in Almont, in Sec. 22, T. 51 N., R. 1 E., New Mexico principal meridian, 800 feet above the junction of Taylor and East Rivers.

Records Available.—July 27, 1910, to November 30, 1913; March 15, 1915, to September 30, 1918.

Drainage Area.—413 square miles.

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge Measurements.—Made from highway bridge.

Winter Flow.—Ice causes backwater.

Diversions.—There are no court decrees for diversions from Taylor River, but from Willow Creek, which enters above, there are decrees for 12 second-feet diversion.

Accuracy.—Conditions are favorable for accurate results; the estimates are considered good.

Co-operation.—Records furnished by the United States Geological Survey.

GUNNISON RIVER NEAR GUNNISON

Location.—At highway bridge, 2 miles below Gunnison. Nearest tributary, Tomichi Creek, enters about 1 mile below.

Records Available.—November 27, 1910, to November 30, 1914; April 27, 1916, to September 30, 1918.

Drainage Area.—1,010 square miles.

Gage.—Bristol automatic gage.

Channel.—Somewhat shifting.

Discharge Measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter Flow.—Ice causes backwater during the winter months.

Diversions.—There are court decrees for diversions of 250 second-feet from Gunnison River, between this station and the forks at Almont, and diversions of 270 second-feet from intervening tributaries.

Co-operation.—Station is maintained in co-operation with the United States Geological Survey.

Discharge of Taylor River at Almont for 1917.
Drainage Area, 413 Square Miles. Altitude, 8,031 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	132	77	151	132	210	610	2100	610	291	190	190	160
2	132	102	132	151	210	610	1860	500	291	190	190	160
3	132	151	117	170	210	690	1780	465	291	190	190	160
4	132	151	132	132	210	830	1700	465	291	190	190	160
5	132	132	132	132	190	990	1540	465	291	190	190	160
6	132	132	132	132	151	935	1540	465	291	190	160	135
7	132	132	132	132	190	935	1460	435	291	190	160	135
8	132	132	132	151	170	1110	1310	405	291	190	160	135
9	132	132	132	132	170	1700	1460	378	291	190	160	115
10	117	132	132	151	232	2020	1240	405	291	190	160	115
11	102	132	132	170	325	2100	1110	465	281	190	160	115
12	117	132	132	170	465	2020	1110	405	281	190	160	115
13	151	151	132	170	780	2260	1110	535	281	190	160	115
14	151	132	132	170	880	2500	1050	465	281	190	160	115
15	151	132	132	190	935	2660	1050	435	281	190	160	115
16	132	117	132	132	1380	2980	880	405	281	190	160	115
17	117	132	132	132	1310	3220	780	465	281	190	160	115
18	117	170	132	151	990	3300	735	435	258	190	160	115
19	117	151	132	170	990	3140	780	378	236	190	160	115
20	102	151	170	132	935	2820	880	350	236	190	160	115
21	77	151	170	151	690	2660	690	350	227	190	160	115
22	77	151	170	253	690	2500	735	350	206	190	160	115
23	102	132	132	405	690	2500	690	350	186	190	160	115
24	117	132	151	690	690	2500	935	350	186	190	160	115
25	132	132	170	650	690	2500	1240	350	186	190	160	115
26	132	151	170	690	650	2340	1460	350	186	190	160	115
27	132	151	132	535	610	2260	1050	350	186	190	160	115
28	132	151	132	465	610	2180	780	350	186	190	160	115
29	132	......	132	378	610	2180	690	350	186	190	160	115
30	132	......	132	210	610	2180	690	325	186	190	160	115
31	132	......	132	......	610	....	690	300	......	190	......	115
Total	3859	3824	4305	7429	18083	61230	35125	12706	7528	5890	4950	3830
Mean	124	137	139	248	583	2040	1130	410	251	190	165	124
Max	151	170	170	690	1380	3300	2100	610	291	190	190	160
Min	77	77	117	132	151	610	690	300	186	190	160	115
Acre-ft.	7620	7610	8550	14800	35800	121000	69500	25200	14900	11700	9820	7620

Discharge of Taylor River at Almont for 1918.
Drainage Area, 413 Square Miles. Altitude, 8,031 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	115	115	115	160	298	1050	935	325	225	......	......	......
2	115	115	115	160	355	1050	935	325	225	......	......	......
3	115	100	141	160	385	1240	832	325	225	......	......	......
4	115	115	135	160	570	1700	785	325	270	......	......	......
5	115	160	135	160	740	1780	740	325	270	......	......	......
6	115	115	135	148	935	2100	740	355	298	......	......	......
7	115	135	115	135	990	2260	740	325	270	......	......	......
8	115	125	135	160	935	2420	785	325	270	......	......	......
9	115	115	160	135	832	2500	880	325	325	......	......	......
10	115	160	175	160	740	2660	785	325	652	......	......	......
11	115	160	148	148	455	2980	785	355	652	......	......	......
12	115	160	135	190	530	3140	740	355	492	......	......	......
13	135	160	148	190	652	3220	740	325	455	......	......	......
14	135	125	135	225	832	3220	785	325	355	......	......	......
15	135	160	135	190	935	2740	785	325	325	......	......	......
16	135	160	135	190	1180	2580	695	325	298	......	......	......
17	160	160	135	175	1110	2660	610	325	270	......	......	......
18	125	208	148	160	1110	2420	570	325	270	......	......	......
19	125	190	135	160	1110	2420	530	325	270	......	......	......
20	135	160	135	148	1240	2420	530	325	248	......	......	......
21	135	175	148	160	1110	2420	455	270	248	......	......	......
22	125	148	135	160	1110	2420	455	270	248	......	......	......
23	115	190	135	175	1380	2420	455	270	248	......	......	......
24	115	135	135	225	1540	2070	455	270	248	......	......	......
25	115	115	135	248	1460	1700	455	270	248	......	......	......
26	115	125	135	225	1310	1380	420	225	248	......	......	......
27	115	135	135	325	1180	1460	385	225	248	......	......	......
28	115	135	135	225	1310	1310	325	225	225	......	......	......
29	115	......	135	225	1240	1180	325	225	225	......	......	......
30	135	......	135	248	1180	1110	325	225	225	......	......	......
31	135	......	160	......	1180	....	325	225	......	......	......	......
Total	3800	4056	4280	5530	29934	63980	19307	9290	9076	......	......	......
Mean	123	145	138	184	966	2130	623	300	303	......	......	......
Max	160	208	175	325	1540	3220	935	355	652	......	......	......
Min	115	100	115	135	298	1050	325	225	225	......	......	......
Acre-ft	7560	8050	8480	10900	59400	127000	38300	18400	18000	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Gunnison River at Gunnison for 1917.

Drainage Area, 1,010 Square Miles. Altitude, 7,673 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	626	1410	4590	1690	470	353	353	285
2	......	......	......	......	626	1410	4250	1620	404	353	333	285
3	......	......	......	......	645	1540	4000	1540	448	345	345	285
4	......	......	......	......	626	2060	3910	1330	384	345	361	248
5	......	......	......	......	664	2370	3820	1260	425	345	353	230
6	......	......	......	......	485	1920	8820	1160	404	345	321	200
7	......	......	......	......	485	2140	3570	1060	397	345	333	190
8	......	......	......	239	528	2610	3410	1000	364	345	337	190
9	......	......	......	268	448	3410	3330	940	432	345	325	190
10	......	......	......	301	528	4080	3250	879	410	345	305	190
11	......	......	......	340	757	4250	3090	1130	410	345	325	190
12	......	......	......	404	1050	4080	2770	1060	418	345	305	190
13	......	......	......	478	1300	4340	2930	1130	455	330	285	190
14	......	......	......	404	2060	4590	2370	1060	485	320	325	190
15	......	......	......	404	2530	4950	2370	879	485	305	321	190
16	......	......	......	390	2930	5130	2060	879	494	309	317	180
17	......	......	......	323	3170	5130	1920	940	448	313	313	180
18	309	......	......	440	3330	5680	1760	903	440	321	305	184
19	......	......	......	345	3330	5680	1990	789	410	313	305	180
20	......	......	......	365	2690	5490	1760	746	397	337	265	180
21	......	192	......	455	2140	5680	1690	664	364	353	305	180
22	......	......	......	746	1920	5490	1760	626	390	353	345	180
23	......	......	......	1010	1690	5870	1760	579	390	361	313	180
24	......	......	......	1270	1690	5490	1920	544	390	353	265	180
25	......	......	......	1390	1690	5310	2140	502	364	349	258	190
26	......	......	......	1540	1620	5310	2610	579	390	305	258	190
27	......	......	......	1260	1470	5310	2370	432	371	333	251	190
28	......	......	......	1060	1500	5130	2060	519	378	321	248	196
29	......	......	......	857	1530	4950	1920	510	371	349	265	196
30	......	......	......	626	1480	4950	1990	502	358	345	265	190
31	......	......	......	......	1480	....	1840	494	......	349	......	190
Total	......	......	......	14915	47018	125760	83030	27946	12346	10475	9205	6209
Mean....	......	......	......	648	1520	4190	2680	901	412	338	307	200
Max......	......	......	......	1540	3330	5870	4590	1690	494	361	361	285
Min.......	......	......	......	239	448	1410	1690	432	358	305	248	180
Acre-ft.	......	......	......	29600	93500	249000	165000	55400	24500	20800	18300	12300

Discharge of Gunnison River at Gunnison for 1918.

Drainage Area, 1,010 Square Miles. Altitude, 7,673 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	184	215	305	335	1000	2900	2530	695	345	345	......	......
2	184	206	305	335	1400	2900	2220	695	385	345	......	......
3	180	215	305	335	1690	3400	2370	695	435	345	......	......
4	180	230	305	345	1920	3550	2290	695	435	345	......	......
5	180	248	305	345	2290	4100	2370	695	490	345	......	......
6	180	248	305	345	2610	4230	2140	835	520	345	......	......
7	180	248	305	345	2690	6200	2060	695	462	345	......	......
8	180	265	305	365	2530	8100	1990	679	462	385	......	......
9	190	265	305	365	2450	8600	1920	679	615	377	......	......
10	190	265	305	435	2370	10300	1920	679	1470	365	......	......
11	190	265	305	490	2060	11400	1840	615	1840	365	......	......
12	190	265	305	582	1920	11400	1760	615	2290	365	......	......
13	195	265	305	655	1990	11400	1690	550	1000	345	......	......
14	195	265	305	695	2530	10300	1690	550	655	345	......	......
15	195	265	305	655	2690	9200	1620	582	615	......	......	......
16	195	265	305	582	2930	8000	1540	550	582	......	......	......
17	195	265	305	520	3090	8000	1470	538	550	......	......	......
18	195	265	305	435	3170	7200	1400	490	520	......	......	......
19	190	265	285	410	3170	5200	1330	479	490	......	......	......
20	190	265	285	365	3250	5200	1330	462	435	......	......	......
21	190	265	248	365	3170	5200	1260	446	435	......	......	......
22	190	265	224	385	3170	5000	1260	435	385	......	......	......
23	196	265	230	435	3330	5000	1120	435	385	......	......	......
24	190	265	285	615	3740	4590	1120	462	385	......	......	......
25	190	265	285	655	3660	4250	1060	435	377	......	......	......
26	190	265	305	835	3740	4080	942	435	365	......	......	......
27	200	265	325	942	3250	3570	942	435	365	......	......	......
28	215	265	325	785	3330	3250	885	425	365	......	......	......
29	196	......	325	740	3090	3010	885	385	365	......	......	......
30	200	......	335	835	3090	2690	785	385	365	......	......	......
31	215	......	335	......	3010	....	785	385	......	......	......	......
Total	5930	7175	9282	15531	84330	182220	48524	17136	18388	......	......	......
Mean....	191	256	299	518	2720	6070	1570	553	613	......	......	......
Max......	215	265	335	942	3740	11400	2530	835	2290	......	......	......
Min.......	180	206	224	335	1000	2690	785	385	345	......	......	......
Acre-ft.	11700	14200	18400	30800	167000	361000	96500	34000	36500	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

GUNNISON RIVER NEAR GRAND JUNCTION

Location.—In NW. ¼ Sec. 35, T. 1 S., R. 1 W., a quarter of a mile below the Redlands Irrigation and Power Company's canal, and one and one-half miles above mouth of Gunnison River in Grand Junction, in Mesa County, below all tributaries.

Drainage Area.—7,920 square miles (measured on Colo. Geo. Survey map, scale 1:500,000).

Records Available.—April 1, 1917, to September 30, 1918. From October 19, 1894, to December 21, 1895, and May 2, 1897, to November 30, 1899, station maintained nearer mouth.

Gage.—Vertical staff at left bank one-quarter of a mile below canal intake; read by employee of Redlands Irrigation and Power Company. Original gage vertical staff attached to wall of D. & R. G. pump house some distance below present site. Moved July 5, 1895, to highway bridge one mile below present gage. Relation between different gages not determined.

Discharge Measurements.—Made from car and cable at gage section.

Channel and Control.—Channel composed of gravel well compacted; permanent. Control at rapids 500 feet down stream; practically permanent. Banks high and not subject to overflow.

Diversions.—Below all diversions from Gunnison River. Most of water diverted through Redlands canal is for pumping and is returned to Grand River below the Gunnison.

Combined Flow.—The combined flow of the Gunnison River and Redlands power canal represents the flow of the Gunnison River which enters the Grand River less about 25 second-feet which is used during the irrigation season.

Co-operation.—Records furnished by the United States Geological Survey.

TOMICHI CREEK AT SARGENTS

Location.—In NW. ¼ Sec. 28, T. 48 N., R. 5 E., at railroad bridge three-quarters of a mile west of Sargents, in Saguache County. Nearest tributary, Marshall Creek, which enters one-quarter mile above.

Drainage Area.—145 square miles (measured on Forest atlas).

Record Available.—May 12, 1917, to November 9, 1918.

Gage.—Lallie recording gage installed October 5, 1917, and referred to vertical staff attached to down stream piling of railroad bridge; read by W. S. Cole.

Discharge Measurements.—Made by wading or from pile bent bridge.

Channel and Control.—Composed of gravel, shifting; control 30 feet down stream at small rapids of compact gravel; practically permanent.

Diversions.—A few small ditches divert water for irrigation above Sargents.

Co-operation.—Station maintained in co-operation with the United States Geological Survey.

Discharge of Gunnison River at Grand Junction for 1917.
Drainage Area, 7,920 Square Miles. Altitude, 4,573 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	1490	4860	9980	15000	3960	678	830	1090	1040
2	......	......	......	1500	3420	9080	13200	3100	642	830	1060	990
3	......	......	......	1320	5750	9470	11800	3300	670	910	1050	990
4	......	......	......	1320	5740	11800	10800	2270	670	910	1060	990
5	......	......	......	1260	5450	13800	10200	2050	540	910	1120	990
6	......	......	......	1190	5540	14100	9370	2150	933	830	1110	830
7	......	......	......	1330	4950	12800	8850	2550	920	830	1060	795
8	......	......	......	1180	5150	13200	8850	2020	560	830	1070	730
9	......	......	......	1440	4660	12500	8350	1490	505	705	1070	760
10	......	......	......	2130	4410	20600	7990	1340	580	860	1060	730
11	......	......	......	2400	4710	23800	8120	1360	620	805	995	730
12	......	......	......	2310	5860	23000	7620	1580	908	815	1020	830
13	......	......	......	2910	6590	21600	6550	2480	783	860	1020	910
14	......	......	......	3960	8540	21800	6130	3140	1150	775	1020	1040
15	......	......	......	3840	12800	22600	5280	2900	1000	815	1080	1080
16	......	......	......	3370	17900	24200	5100	2090	980	815	1020	1080
17	......	......	......	2740	19800	24200	4630	1840	998	925	1360	990
18	......	......	......	2250	21400	24800	4000	1960	943	965	990	910
19	......	......	......	2740	21400	24600	3880	2100	910	965	990	910
20	......	......	......	2340	18000	23800	3860	1600	865	975	910	830
21	......	......	......	2020	15600	21400	3980	1300	855	1010	760	830
22	......	......	......	2160	13700	20600	3620	1220	855	1100	910	830
23	......	......	......	3970	12800	20300	3300	968	860	1020	950	910
24	......	......	......	6040	13300	20400	3820	940	810	1060	1040	830
25	......	......	......	7650	12400	19200	5540	900	800	1020	1040	910
26	......	......	......	8140	11200	19000	4530	785	810	960	1040	910
27	......	......	......	8280	10100	18600	4800	720	1220	955	990	910
28	......	......	......	7820	10100	17100	4520	703	1120	990	1040	990
29	......	......	......	7580	10200	15700	3690	698	1080	1020	1220	990
30	......	......	......	7700	10500	14800	3660	732	875	1020	1050	910
31	......	......	......	......	12000	......	4000	740	......	885	......	795
Total	......	......	......	104380	318830	548830	204940	54716	25140	28170	31195	27970
Mean	......	......	......	3480	10300	18300	6610	1770	858	909	1040	902
Max.	......	......	......	8280	21400	24800	15000	3690	1220	1100	1360	1080
Min.	......	......	......	1180	3420	9080	3300	698	505	705	760	730
Acre-ft.	......	......	......	207000	633000	1090000	406000	109000	49000	55900	61900	55500

Discharge of Gunnison River at Grand Junction for 1918.
Drainage Area, 7,920 Square Miles. Altitude, 4,573 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	910	795	1080	1910	4370	6540	4340	700	300	910	1380	......
2	910	760	990	2000	4740	5680	3680	630	290	910	1380	......
3	830	795	990	2080	5530	6100	3200	618	290	870	1280	......
4	830	910	1040	2080	6160	7750	3530	620	460	830	1490	......
5	830	950	1080	2080	8240	8530	3540	760	640	830	1280	......
6	870	990	1280	2080	9520	9840	2920	950	670	830	1280	......
7	830	1040	1490	1950	10300	10600	2760	950	700	830	1380	......
8	795	1060	1490	1830	10300	13000	2920	910	640	795	1280	......
9	760	1080	1490	1710	9800	12700	3060	580	730	760	1280	......
10	760	1080	1280	1830	9280	13700	3000	490	1490	760	1180	......
11	760	1080	1180	2650	7790	14900	3120	580	3760	830	1280	......
12	810	1080	1230	3120	6460	16200	3760	1280	4100	990	1280	......
13	860	1040	1280	3600	6040	16600	3440	1230	2800	1040	1280	......
14	910	1180	1280	3930	6900	16900	3120	1280	1950	910	1230	......
15	910	1180	1280	3760	9290	16900	3120	1710	1950	870	1230	......
16	1080	1180	1180	3440	10900	15200	2800	2210	1830	830	1280	......
17	990	1080	1040	3120	12000	14000	2650	1380	1710	990	1380	......
18	870	1080	1180	2650	12000	12800	2500	870	1490	1040	1280	......
19	990	1080	1180	2080	11400	12500	2080	730	1380	990	1230	......
20	1040	1080	1180	2560	11400	11200	1710	550	1280	910	1130	......
21	990	910	1230	1800	11200	11400	1380	490	1230	1080	1280	......
22	1080	990	1280	1690	10100	10900	1630	490	1080	1180	1230	......
23	950	1130	1230	1910	10100	11700	1560	460	1080	1080	1280	......
24	910	1180	1420	2410	11200	12000	1580	490	1040	1080	1280	......
25	910	1230	1600	3000	11700	10400	1530	460	1080	1230	1180	......
26	910	1130	1710	3960	10900	8820	1480	460	1130	1710	1280	......
27	930	1080	1830	4480	9840	8320	1290	400	1080	1600	1180	......
28	950	1080	2210	4320	8550	6960	930	400	1080	1280	1040	......
29	870	......	2080	3990	8660	6090	990	325	1040	1180	1080	......
30	910	......	1600	3830	7900	5670	890	275	950	1280	990	......
31	910	......	1830	......	7430	......	685	275	......	1280	......	......
Total	27865	29250	42240	81850	280000	333900	75195	23553	39250	31705	37580	......
Mean	899	1040	1360	2730	9030	11100	2430	760	1310	1020	1250	......
Max.	1080	1230	2210	4480	12000	16900	4340	2210	4100	1710	1490	......
Min.	760	760	990	1690	4370	5670	685	275	290	760	990	......
Acre-ft.	55300	57800	83600	162000	555000	660000	149000	46700	78000	62700	74400	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Tomichi Creek at Sargents for 1917.
Drainage Area, 145 Square Miles. Altitude, 8,467 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	134	170	82	44	33	39	......
2	......	......	......	......	......	126	160	82	39	33	31	......
3	......	......	......	......	......	146	130	89	39	32	30	......
4	......	......	......	......	......	190	130	76	37	31	39	......
5	......	......	......	......	......	235	112	70	34	31	36	......
6	......	......	......	......	......	192	104	64	32	31	37	......
7	......	......	......	......	......	220	104	64	37	30	29	......
8	......	......	......	......	......	257	121	59	37	30	32	......
9	......	......	......	......	......	375	140	59	37	30	29	......
10	......	......	......	......	......	475	170	64	34	30	30	......
11	......	......	......	......	......	483	140	64	34	30	30	......
12	......	......	......	......	68	523	112	64	49	29	28	......
13	......	......	......	......	64	515	104	68	34	29	27	......
14	......	......	......	......	77	604	96	70	39	29	26	......
15	......	......	......	......	123	575	96	59	44	29	29	......
16	......	......	......	......	142	495	93	59	37	29	28	......
17	......	......	......	......	170	467	89	61	34	29	30	......
18	......	......	......	......	200	427	95	59	34	29	31	......
19	......	......	......	......	200	415	109	57	30	34	32	......
20	......	......	......	......	192	387	93	54	30	40	33	......
21	......	......	......	......	170	387	82	49	30	45	34	......
22	......	......	......	......	154	348	82	49	34	38	35	......
23	......	......	......	......	140	348	89	49	34	35	36	......
24	......	......	......	......	146	313	96	47	34	37	37	......
25	......	......	......	......	166	250	121	47	30	37	......	......
26	......	......	......	......	146	257	130	44	37	37	......	......
27	......	......	......	......	134	244	112	44	37	34	......	......
28	......	......	......	......	130	244	89	44	34	34	......	......
29	......	......	......	......	132	215	89	49	34	37	......	......
30	......	......	......	......	138	190	89	44	34	45	......	......
31	......	......	......	......	128	......	96	44	......	44	......	......
Total	......	......	......	......	2820	10037	3443	1834	1073	1041	768	......
Mean	......	......	......	......	141	335	111	59.2	35.8	33.6	32.0	......
Max.	......	......	......	......	200	604	170	89	49	45	39	......
Min.	......	......	......	......	64	126	82	44	30	26	26	......
Acre-ft.	......	......	......	......	5590	19900	6820	3640	2130	2070	1520	......

Discharge of Tomichi Creek at Sargents for 1918.
Drainage Area, 145 Square Miles. Altitude, 8,467 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	92	306	89	40	26	34	27	......
2	......	......	......	......	95	278	90	39	26	34	27	......
3	......	......	......	......	116	292	90	45	34	33	29	......
4	......	......	......	......	134	281	95	47	39	31	29	......
5	......	......	......	......	134	295	96	41	54	26	29	......
6	......	......	......	......	154	302	92	41	48	22	29	......
7	......	......	......	......	168	309	86	39	37	23	23	......
8	......	......	......	......	170	302	81	38	30	20	24	......
9	......	......	......	......	192	302	81	39	44	20	21	......
10	......	......	......	......	182	302	81	35	78	24	......	......
11	......	......	......	......	160	302	80	41	70	24	......	......
12	......	......	......	......	140	302	77	40	54	24	......	......
13	......	......	......	......	138	312	82	40	49	24	......	......
14	......	......	......	......	154	284	77	52	45	24	......	......
15	......	......	......	......	160	260	81	49	41	24	......	......
16	......	......	......	......	185	213	89	36	40	24	......	......
17	......	......	......	......	232	195	76	29	40	28	......	......
18	......	......	......	......	281	210	70	26	39	28	......	......
19	......	......	......	......	274	192	64	26	38	27	......	......
20	......	......	......	46	302	168	59	28	35	28	......	......
21	......	......	......	36	278	168	52	44	30	31	......	......
22	......	......	......	46	292	204	52	35	32	33	......	......
23	......	......	......	51	326	185	54	30	32	33	......	......
24	......	......	......	61	362	160	54	29	39	36	......	......
25	......	......	......	61	378	136	58	26	37	38	......	......
26	......	......	......	72	374	128	51	26	35	30	......	......
27	......	......	......	77	370	117	47	26	34	26	......	......
28	......	......	......	71	370	110	44	27	30	26	......	......
29	......	......	......	70	382	106	48	27	34	26	......	......
30	......	......	......	78	362	95	48	26	34	26	......	......
31	......	......	......	......	350	......	44	23	......	26	......	......
Total	......	......	......	669	7307	6816	2188	1090	1204	853	238	......
Mean	......	......	......	60.8	236	227	70.6	35.2	40.1	27.5	26.4	......
Max.	......	......	......	......	382	312	96	52	78	38	......	......
Min.	......	......	......	......	92	95	44	23	26	20	......	......
Acre-ft.	......	......	......	1330	14500	13500	4340	2160	2390	1690	471	......

Unless otherwise noted, all discharges are in cubic feet per second.

LAKE FORK AT LAKE CITY

Location.—In Sec. 34, T. 44 N., R. 4 W., at private bridge one-third mile above Henson Creek in Lake City, Hinsdale County.

Drainage Area.—126 square miles (measured on topographic map).

Records Available.—April 21 to November 20, 1918.

Gage.—Vertical staff fastened to down stream side right bridge abutment; read by Eugene Otis.

Discharge Measurements.—Made by wading or from bridge.

Channel and Control.—Bed of stream composed of coarse gravel well compacted; permanent. Banks not subject to overflow except during extreme high stages. Control located at small rapids 250 feet down stream; apparently permanent.

Ice.—Stage-discharge relation seriously affected by ice.

Diversions.—Practically none which do not return to stream above station. Court decrees for 22 second-feet from Lake Fork below station.

Regulation.—Flow naturally regulated by Lake San Cristobal, located 4 miles up stream; area 1 square mile. During low water operation of power plant, located 1 mile up stream, may influence discharge slightly.

Co-operation.—Records furnished by U. S. Geological Survey.

Discharge of Lake Fork at Lake City for 1918.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	70	196	212	59	52	48	28	......
2	......	......	......	......	78	193	199	74	52	48	28	......
3	......	......	......	......	90	273	199	80	52	45	27	......
4	......	......	......	......	99	412	209	78	52	45	26	......
5	......	......	......	......	108	507	202	78	59	44	27	......
6	......	......	......	......	128	542	193	82	57	43	29	......
7	......	......	......	......	144	584	193	82	52	38	30	......
8	......	......	......	......	141	591	174	78	50	36	28	......
9	......	......	......	......	128	619	168	80	103	36	26	......
10	......	......	......	......	134	688	183	78	183	36	27	......
11	......	......	......	......	124	704	183	95	186	39	26	......
12	......	......	......	......	110	720	180	90	183	36	25	......
13	......	......	......	......	112	729	180	86	174	36	26	......
14	......	......	......	......	141	756	177	99	160	33	25	......
15	......	......	......	......	193	738	174	103	146	30	27	......
16	......	......	......	......	234	648	168	101	131	30	28	......
17	......	......	......	......	252	598	157	92	117	30	27	......
18	......	......	......	......	277	542	146	82	105	33	24	......
19	......	......	......	......	289	528	136	74	95	33	24	......
20	......	......	......	......	316	507	136	74	84	36	25	......
21	......	......	......	34	307	464	117	90	82	32	26	......
22	......	......	......	34	264	452	112	86	74	33	26	......
23	......	......	......	34	268	452	108	84	78	30	28	......
24	......	......	......	36	334	429	99	76	70	30	25	......
25	......	......	......	18	339	418	99	68	68	30	24	......
26	......	......	......	44	349	395	90	64	60	30	......	......
27	......	......	......	48	307	364	80	60	59	26	......	......
28	......	......	......	55	302	330	78	57	57	30	......	......
29	......	......	......	54	273	281	76	59	54	30	......	......
30	......	......	......	60	302	248	70	59	52	30	......	......
31	......	......	......	......	234	......	66	55	......	28	......	......
Total	......	......	......	417	6447	14908	4564	2423	2747	1084	662	......
Mean	......	......	......	41.7	208	497	147	78.2	91.6	35.0	26.5	......
Max.	......	......	......	60	349	756	212	103	186	48	30	......
Min.	......	......	......	18	70	193	66	55	50	26	24	......
Acre-ft.	......	......	......	827	12800	29600	9040	4810	5450	2150	1310	......

Unless otherwise noted, all discharges are in cubic feet per second.

UNCOMPAHGRE RIVER AT OURAY

Location.—Near highway bridge in Sec. 31, T. 44 N., R. 7 W., New Mexico principal meridian, half a mile south of Ouray, Colo. Nearest tributary, Canon Creek, enters 150 feet below; nearest tributary above is Bear Creek.

Records Available.—January 25, 1911, to November 30, 1918; January 7 to March 17, 1908, records were kept at the power plant of the Ouray Electric Light & Power Co., 1 mile south of Ouray.

Drainage Area.—44 square miles.

Gage.—Vertical staff.

Channel.—Permanent, except at time of high water, when channel scours and fills.

Discharge Measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter Flow.—Little if any backwater from ice at this station, as channel remains open during the year.

Diversions.—Water is diverted 2 miles above the station by the Ouray Light & Power Co. This amounts approximately to 8 second-feet and is returned to the river below the station.

Accuracy.—Results considered reliable.

Co-operation.—Records furnished by the United States Geological Survey.

UNCOMPAHGRE RIVER BELOW OURAY

Location.—At left bank 700 feet above the lowest bridge in Ouray, one-third mile below the railroad station. It is below all tributaries in Ouray.

Records Available.—May 12, 1913, to November 30, 1918.

Drainage Area.—76 square miles.

Gage.—Vertical staff, moved upstream from former location. No relation established between old and new gages. Recording gage installed March 28, 1917.

Control.—Shifting.

Discharge Measurements.—Made from bridge and by wading.

Winter Flow.—Ice causes little or no backwater as the warm springs above prevent freezing.

Diversions.—There are no diversions which are not returned to the river above the station.

Accuracy.—Owing to the high altitude of the station (7,700 feet) there are diurnal fluctuations of stage at certain seasons, due to alternate melting and freezing, and the mean daily gage height, based on morning and evening readings and the maximum stage for the 24-hour period, may be somewhat in error. For this reason, and because of the shifting character of the channel, the estimates can not be considered better than fair, or, possibly, good.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of Uncompahgre River at Ouray for 1917.

Drainage Area, 44 Square Miles. Altitude, 7,710 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17	3	3	7	44	97	635	135	20	17	1.8	0.3
2	7	3	3	12	46	106	590	105	20	18	1.8	1.5
3	7	3	2	12	46	137	545	77	24	16	1.5	1.5
4	7	3	1	12	48	294	500	77	20	14	1.5	1.5
5	18	3	1	12	51	185	480	77	19	12	1.5	1.5
6	18	24	1	14	46	160	440	77	18	12	1.5	1.5
7	19	24	1	14	44	266	500	69	16	11	1.4	1.5
8	18	24	2	22	37	402	385	61	15	11	1.4	1.8
9	18	24	3	25	37	545	323	58	17	10	1.2	2.7
10	6	24	3	28	35	440	323	55	14	9.4	1.2	2.7
11	6	24	3	29	46	500	323	61	21	8.6	1.2	1.5
12	8	3	3	37	35	545	323	69	20	7.0	1.2	4.0
13	14	3	3	37	44	590	280	76	20	6.4	1.9	0.9
14	6	3	12	48	148	830	266	93	41	6.4	0.6	0.8
15	6	3	12	46	211	780	266	67	23	6.4	0.3	0.6
16	24	3	12	41	266	780	238	56	23	5.8	0	0.3
17	14	3	14	37	280	880	238	54	21	5.8	0	0.4
18	6	10	14	34	266	880	185	54	20	5.8	1.2	0.3
19	9	8	14	22	185	730	185	46	15	4.6	1.2	0.4
20	19	9	14	17	116	780	185	39	14	4.6	1.2	0.6
21	13	2	14	28	97	780	172	35	13	4.0	1.5	0
22	13	3	13	32	88	880	160	34	12	3.8	1.5	1.8
23	4	5	12	39	97	780	160	32	11	3.8	2.4	1.5
24	3	7	13	48	79	780	137	32	9	3.8	2.1	1.5
25	3	9	13	56	79	830	137	30	9	3.8	1.5	0.8
26	3	8	14	62	70	830	137	28	12	3.6	3.6	2.4
27	3	3	14	62	97	880	185	27	11	3.4	5.2	0.9
28	3	3	16	51	106	830	148	27	10	3.2	5.8	1.5
29	3	......	21	48	106	930	126	26	10	2.1	5.8	1.5
30	3	......	28	48	106	830	126	20	9	2.1	18	1.5
31	3	......	16	......	106	......	137	20	......	1.8	......	1.8
Total	301	244	295	980	3062	18277	8835	1717	507	227.2	71.0	41.5
Mean....	9.71	8.71	9.52	32.7	98.8	609	285	55.4	16.9	7.33	2.37	1.34
Max.	24	24	28	62	280	930	635	135	41	18	18	4
Min.......	3	2	1	7	35	97	126	20	9	1.8	0	0
Acre-ft.	597	484	585	1950	6080	36200	17500	3410	1010	451	141	82.4

Discharge of Uncompahgre River at Ouray for 1918.

Drainage Area, 44 Square Miles. Altitude, 7,710 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.6	6.4	9.4	10.2	55	137	137	38	3.0	4.6	4.0	......
2	5.2	7.0	9.4	7	101	148	116	46	3.0	4.6	4.0	......
3	6.4	6.4	7.0	6.4	101	238	132	45	3.6	4.6	3.8	......
4	6.4	6.4	7.0	7.8	126	414	148	41	4.6	4.6	3.8	......
5	5.8	7.0	7.0	8.6	124	590	126	40	16	4.6	3.8	......
6	3.4	7.0	7.0	11	160	590	137	37	5.2	4.6	3.8	......
7	4.0	6.4	6.4	16	185	590	148	36	3.2	4.0	3.8	......
8	4.0	7.0	5.2	16	155	680	134	35	1.8	4.6	3.8	......
9	3.0	15.0	4.0	22	137	730	120	69	31	4.6	3.8	......
10	3.0	16.0	4.0	34	116	780	106	51	216	4.6	3.8	......
11	2.4	17.2	4.0	32	112	680	97	46	69	5.2	3.8	......
12	3.0	17.2	4.6	29	106	730	97	39	46	5.2	3.8	......
13	3.0	6.4	4.6	26	160	880	97	39	37	5.2	3.8	......
14	3.2	6.4	3.8	22	211	930	79	65	32	5.2	3.8	......
15	4.0	5.8	4.0	20	280	980	70	51	29	21	3.8	......
16	4.0	5.8	4.0	17	308	590	62	51	23	21	3.8	......
17	4.6	12	4.0	14	338	590	56	46	23	4.6	4.6	......
18	7.0	11	4.6	3.0	323	323	54	39	22	3.8	4.0	......
19	7.0	12	4.6	1.8	338	308	48	31	17	3.8	4.0	......
20	6.4	10.2	4.0	1.2	338	280	48	31	15	4.0	4.0	......
21	7.0	11	4.0	3.0	266	252	62	29	13	4.0	4.0	......
22	7.0	11	4.0	4.6	280	266	59	29	7.8	4.0	4.0	......
23	20.8	11	5.2	6.4	323	266	56	28	7.0	4.0	3.8	......
24	5.5	11	5.2	35	323	266	58	25	5.8	3.8	4.0	......
25	7.0	10.2	5.8	35	294	266	59	25	4.6	3.8	4.0	......
26	4.0	9.4	6.4	44	294	224	46	23	4.6	3.8	4.0	......
27	7.0	9.4	7.8	46	294	211	44	23	4.6	3.8	4.0	......
28	6.4	9.4	9.4	29	294	186	39	25	4.6	4.0	4.0	......
29	7.0	......	9.4	37	252	160	41	26	4.6	4.0	4.0	......
30	7.0	......	10.2	59	224	148	46	25	4.6	4.0	4.6	......
31	7.0	......	10.2	......	172	......	39	3	......	4.0	......	......
Total	175.1	271.0	186.2	604.0	6790	13433	2561	1137	661.6	167.6	118.2	......
Mean....	5.65	9.68	6.01	20.1	219	448	82.6	36.7	22.1	5.41	3.94	......
Max.	20.8	17.2	10.2	59	338	980	148	69	216	21	4.6	......
Min.......	2.4	5.8	3.8	1.2	55	137	39	3	1.8	3.8	3.8	......
Acre-ft.	347	538	370	1200	13500	26700	5080	2260	1320	333	234	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Uncompahgre River Below Ouray for 1917.
Drainage Area, 76 Square Miles. Altitude, 7,710 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34	28	28	41	100	169	1400	228	79	66	36	33
2	33	28	26	38	103	178	1140	202	75	60	35	33
3	33	28	24	35	104	254	1140	185	74	57	33	32
4	32	28	24	39	105	331	1090	180	73	54	35	30
5	32	28	24	51	96	340	875	180	72	52	34	28
6	32	28	26	49	91	288	835	180	72	53	33	27
7	32	29	26	46	92	362	1000	180	73	51	34	25
8	30	29	26	73	90	545	958	162	73	50	34	26
9	30	29	26	83	84	795	875	154	71	48	33	29
10	34	29	26	71	88	795	875	173	69	47	32	32
11	39	29	26	69	98	755	1000	198	86	46	33	30
12	32	30	26	86	108	915	835	239	91	45	32	31
13	32	30	26	104	145	1040	755	270	88	44	32	29
14	26	29	26	98	248	1180	680	225	84	43	32	31
15	28	28	26	83	331	1320	610	198	75	42	33	31
16	32	28	26	70	362	1450	610	173	72	43	32	30
17	32	27	27	67	405	1450	545	169	66	43	30	30
18	33	28	27	63	410	1680	515	147	62	37	29	30
19	31	28	27	56	319	1400	578	134	62	36	31	31
20	32	29	28	66	236	1360	485	120	60	39	34	31
21	27	28	29	86	202	1450	430	114	59	37	34	29
22	32	26	27	116	192	1400	430	108	58	37	33	28
23	27	31	26	133	198	1450	430	102	58	37	33	29
24	30	31	26	143	190	1540	405	98	55	37	33	29
25	29	37	27	158	178	1500	371	94	54	37	33	28
26	29	38	27	139	162	1500	380	92	70	37	31	28
27	29	35	28	116	150	1540	405	106	58	36	32	28
28	29	31	52	102	169	1580	295	102	54	34	27	28
29	32	......	69	94	188	1580	267	92	53	33	33	27
30	29	......	60	96	185	1500	278	86	54	36	33	28
31	29	......	47	......	178	......	260	83	......	35	......	29
Total	961	827	939	2471	5607	31647	20752	4774	2050	1352	979	910
Mean....	31.0	29.5	30.3	82.4	181	1050	669	154	68.3	43.6	32.6	29.4
Max.	39	38	69	158	410	1680	1400	270	91	66	36	33
Min.......	26	26	24	35	84	169	260	83	53	33	27	25
Acre-ft.	1910	1640	1860	4900	11100	62500	41100	9470	4060	2680	1940	1810

Discharge of Uncompahgre River Below Ouray for 1918.
Drainage Area, 76 Square Miles. Altitude, 7,710 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	28	25	26	53	158	245	239	80	57	53	60	......
2	28	28	32	50	167	335	228	85	54	51	55	......
3	29	26	35	50	176	515	335	77	64	50	51	......
4	29	27	36	47	260	680	405	79	74	50	49	......
5	26	28	32	42	278	795	281	93	85	47	45	......
6	26	28	32	36	307	1000	278	115	73	50	43	......
7	27	28	30	45	303	1220	239	93	67	50	42	......
8	27	23	32	50	260	1090	230	82	73	47	37	......
9	31	25	27	80	260	1450	260	137	152	48	40	......
10	27	29	31	86	239	1630	284	115	395	50	45	......
11	26	31	33	84	176	1730	245	104	260	47	45	......
12	26	30	38	86	162	1500	222	94	167	46	45	......
13	27	28	34	77	200	1540	233	92	141	46	43	......
14	28	26	29	77	319	1800	198	136	126	49	45	......
15	27	28	29	69	458	1680	173	120	115	47	43	......
16	27	24	28	60	480	1400	158	105	106	43	40	......
17	26	26	33	52	503	1220	145	96	97	47	39	......
18	28	26	36	46	527	1220	131	94	87	45	45	......
19	28	25	35	44	552	1040	122	90	84	42	45	......
20	28	26	34	41	545	958	116	84	78	42	43	......
21	26	26	33	46	400	1000	115	78	71	43	41	......
22	27	27	31	54	395	915	109	65	66	43	40	......
23	28	29	34	54	527	958	103	57	68	42	39	......
24	28	29	44	77	558	680	104	53	72	42	44	......
25	29	27	42	93	533	718	102	57	65	42	42	......
26	28	27	43	102	539	545	96	65	64	43	40	......
27	28	28	45	110	485	515	91	73	62	41	38	......
28	27	27	40	98	485	405	86	73	60	42	39	......
29	28	......	47	100	458	335	84	69	57	45	39	......
30	28	......	54	123	380	270	79	70	54	51	37	......
31	28	......	60	......	292	......	78	59	......	58	......	......
Total	854	757	1115	2032	11382	29469	5569	2690	2994	1442	1299	......
Mean....	27.5	27.0	36.0	67.7	367	982	180	86.8	99.8	46.5	43.3	......
Max.	31	31	60	123	558	1880	405	137	395	58	60	......
Min.......	26	23	26	36	158	245	78	53	54	41	37	......
Acre-ft.	1690	1500	2210	4030	22600	58400	11100	5340	5940	2860	2580	......

Unless otherwise noted, all discharges are in cubic feet per second.

UNCOMPAHGRE RIVER AT COLONA

Location.—In Sec. 17, T. 47 N., R. 8 W., one-half mile east of Colona, in Ouray County. No important tributary within several miles.

Drainage Area.—475 square miles approximately (measured by U. S. R. S.).

Records Available.—April 6, 1917, to October 31, 1918.

Gage.—Vertical staff.

Discharge Measurements.—Made from suspension footbridge near gage.

Channel and Control.—Somewhat shifting.

Extremes of Discharge.—No data.

Ice.—No data as station is discontinued during winter.

Diversions.—Only a few small diversions above station.

Co-operation.—Daily discharge furnished by United States Reclamation Service.

UNCOMPAHGRE RIVER AT MONTROSE

Location.—At highway bridge, one-fourth mile west of Montrose. Nearest important tributary, Happy Canyon Creek, enters about 2 miles below.

Records Available.—April 22, 1903, to December 16, 1913; March 8, 1915, to October 31, 1918.

Drainage Area.—565 square miles.

Gage.—Vertical staff; location and datum unchanged.

Channel.—Extremely shifting.

Discharge Measurements.—Made from the bridge.

Winter Flow.—Although ice forms along the edges of the river during the winter months, the river does not freeze over. Observations of gage heights are, however, discontinued during November, December, January, February, and March.

Diversions.—Uncompahgre River is so over-appropriated that the United States Reclamation Service is constructing a tunnel and canal to divert 1,300 second-feet from Gunnison River into the Uncompahgre above Uncompahgre.

Accuracy.—Although the channel is extremely shifting, sufficient discharge measurements were made to afford data for estimates by the indirect method, and these estimates may be considered reliable.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of Uncompahgre River at Colona for 1917.

Drainage Area 443 Square Miles. Altitude, 6,399 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	246	538	1610	430	127	110	......	......
2	......	......	......	......	364	498	1440	430	110	110	......	......
3	......	......	......	......	349	563	1220	400	110	110	......	......
4	......	......	......	......	364	673	1180	375	110	110	......	......
5	......	......	......	......	338	704	1000	375	110	110	......	......
6	......	......	......	110	323	642	910	375	110	110	......	......
7	......	......	......	93	349	642	1040	350	110	93	......	......
8	......	......	......	175	313	739	1040	350	110	93	......	......
9	......	......	......	227	283	1230	990	285	110	93	......	......
10	......	......	......	192	283	1450	941	305	110	93	......	......
11	......	......	......	182	283	1230	1120	327	127	93	......	......
12	......	......	......	164	283	1230	1450	375	127	93	......	......
13	......	......	......	253	338	1450	1150	705	127	61	......	......
14	......	......	......	283	459	1720	1070	485	145	61	......	......
15	......	......	......	235	642	1830	925	460	127	61	......	......
16	......	......	......	182	755	2270	860	460	110	53	......	......
17	......	......	......	175	800	2270	750	460	110	45	......	......
18	......	......	......	175	762	2320	750	400	110	45	......	......
19	......	......	......	156	725	2070	805	350	110	45	......	......
20	......	......	......	145	584	1700	750	305	110	45	......	......
21	......	......	......	235	548	1800	580	285	110	45	......	......
22	......	......	......	298	553	1700	580	265	110	45	......	......
23	......	......	......	338	553	1800	545	222	110	45	......	......
24	......	......	......	385	548	1900	559	222	110	45	......	......
25	......	......	......	495	521	1900	545	222	110	45	......	......
26	......	......	......	385	495	2270	580	183	110	45	......	......
27	......	......	......	385	428	1800	723	183	110	45	......	......
28	......	......	......	349	415	1800	620	183	110	45	......	......
29	......	......	......	298	428	1700	510	183	110	45	......	......
30	......	......	......	338	402	1290	620	145	110	45	......	......
31	......	......	......	......	415	......	485	145	......	45	......	......
Total	......	......	......	6253	14149	43729	27348	10240	3420	2129	......	......
Mean	......	......	......	250	456	1460	882	330	114	68.7	......	......
Max.	......	......	......	495	800	2320	1610	705	145	110	......	......
Min.	......	......	......	93	246	498	485	145	110	45	......	......
Acre-ft.	......	......	......	12400	28000	86900	54200	20300	6780	4220	......	......

Discharge of Uncompahgre River at Colona for 1918.

Drainage Area, 443 Square Miles. Altitude, 6,399 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	260	400	325	166	23	125	......	......
2	......	......	......	......	282	377	400	175	20	125	......	......
3	......	......	......	......	260	560	450	176	16	120	......	......
4	......	......	......	......	355	690	520	158	20	115	......	......
5	......	......	......	......	425	835	520	140	55	115	......	......
6	......	......	......	......	425	875	500	122	87	115	......	......
7	......	......	......	......	477	1000	475	102	56	120	......	......
8	......	......	......	......	425	835	450	86	88	120	......	......
9	......	......	......	......	400	957	550	74	120	115	......	......
10	......	......	......	......	450	1250	760	116	260	115	......	......
11	......	......	......	......	330	1580	700	107	365	120	......	......
12	......	......	......	......	260	1480	300	98	260	120	......	......
13	......	......	......	......	282	1870	585	108	245	120	......	......
14	......	......	......	......	355	2270	550	126	221	115	......	......
15	......	......	......	......	505	2040	515	144	217	115	......	......
16	......	......	......	......	590	1800	505	122	214	120	......	......
17	......	......	......	......	620	1600	475	117	211	120	......	......
18	......	......	......	......	725	1460	444	103	195	120	......	......
19	......	......	......	110	725	1180	396	89	180	120	......	......
20	......	......	......	95	794	1260	390	89	167	120	......	......
21	......	......	......	95	620	1000	385	74	150	120	......	......
22	......	......	......	110	532	1540	370	74	142	120	......	......
23	......	......	......	127	655	1280	355	61	135	125	......	......
24	......	......	......	145	760	1040	340	52	142	135	......	......
25	......	......	......	180	690	925	321	52	140	115	......	......
26	......	......	......	200	725	875	282	52	135	140	......	......
27	......	......	......	240	620	810	256	38	135	150	......	......
28	......	......	......	180	655	476	236	30	135	150	......	......
29	......	......	......	200	590	475	218	30	135	150	......	......
30	......	......	......	220	532	400	170	26	135	150	......	......
31	......	......	......	......	450	......	172	26	......	150	......	......
Total	......	......	......	1902	15774	33140	12915	2933	4404	3880	......	......
Mean	......	......	......	158	509	1100	417	94.6	147	125	......	......
Max.	......	......	......	240	794	2274	760	176	365	150	......	......
Min.	......	......	......	95	260	377	170	26	16	115	......	......
Acre-ft.	......	......	......	3760	31300	65500	25600	2933	8750	7690	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Uncompahgre River at Montrose for 1917.

Drainage Area, 565 Square Miles. Altitude, 5,820 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	71	185	415	1320	367	650	300	......	......
2	......	......	......	63	185	384	1060	315	452	300	......	......
3	......	......	......	63	237	415	822	283	360	321	......	......
4	......	......	......	32	237	705	840	283	442	345	......	......
5	......	......	......	27	223	586	782	237	112	377	......	......
6	......	......	......	56	117	243	625	185	80	395	......	......
7	......	......	......	49	300	321	600	112	535	395	......	......
8	......	......	......	63	237	415	705	266	535	395	......	......
9	......	......	......	148	215	960	730	251	479	330	......	......
10	......	......	......	165	185	1280	1200	266	377	300	......	......
11	......	......	......	101	160	755	1160	49	360	223	......	......
12	......	......	......	124	148	755	960	330	415	43	......	......
13	......	......	......	165	266	870	705	822	395	56	......	......
14	......	......	......	197	535	1100	650	577	360	56	......	......
15	......	......	......	160	870	1680	990	197	367	63	......	......
16	......	......	......	125	755	1280	870	650	377	56	......	......
17	......	......	......	137	900	1630	650	330	367	49	......	......
18	......	......	......	177	793	1850	577	137	360	32	......	......
19	......	......	......	43	650	1550	577	80	377	22	......	......
20	......	......	......	27	377	1100	650	237	336	5	......	......
21	......	......	......	49	315	1240	543	330	300	5	......	......
22	......	......	......	165	237	1200	543	315	266	0	......	......
23	......	......	......	197	452	1280	470	330	283	0	......	......
24	......	......	......	266	336	1370	315	345	266	0	......	......
25	......	......	......	345	321	1360	730	300	251	0	......	......
26	......	......	......	283	177	1450	555	283	160	0	......	......
27	......	......	......	266	148	1160	600	283	90	0	......	......
28	......	......	......	185	197	1200	452	300	56	0	......	......
29	......	......	......	172	215	1280	435	330	266	0	......	......
30	......	......	......	172	251	1550	452	315	300	0	......	......
31	......	......	......	......	384	......	492	300	......	0	......	......
Total	......	......	......	4093	10608	31384	22060	9405	9974	4068	......	......
Mean	......	......	......	136	342	1050	712	303	332	131	......	......
Max.	......	......	......	345	900	1850	1320	822	650	395	......	......
Min.	......	......	......	27	117	243	315	49	56	0	......	......
Acre-ft.	......	......	......	8090	21000	62500	43800	18600	19800	8060	......	......

Discharge of Uncompahgre River at Montrose for 1918.

Drainage Area, 565 Square Miles. Altitude, 5,820 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	360	235	395	360	285	70	......	......
2	......	......	......	......	360	340	360	360	275	90	......	......
3	......	......	......	......	380	560	432	340	285	100	......	......
4	......	......	......	......	515	680	432	360	340	110	......	......
5	......	......	......	......	515	735	475	380	395	110	......	......
6	......	......	......	......	635	760	540	415	380	110	......	......
7	......	......	......	......	495	1050	475	450	360	110	......	......
8	......	......	......	......	495	820	475	380	360	220	......	......
9	......	......	......	......	395	820	475	360	380	110	......	......
10	......	......	......	......	395	1120	560	380	432	110	......	......
11	......	......	......	......	295	1180	515	415	322	110	......	......
12	......	......	......	......	270	990	360	415	100	110	......	......
13	......	......	......	......	270	955	360	395	360	110	......	......
14	......	......	......	......	360	1340	415	495	360	110	......	......
15	......	......	......	......	495	1300	450	285	322	100	......	......
16	......	......	......	......	545	1120	432	35	270	90	......	......
17	......	......	......	28	560	955	415	380	180	100	......	......
18	......	......	......	0	660	955	432	360	163	110	......	......
19	......	......	......	0	660	820	395	360	163	360	......	......
20	......	......	......	0	742	820	360	360	138	340	......	......
21	......	......	......	322	540	680	360	360	115	285	......	......
22	......	......	......	360	360	900	395	395	110	110	......	......
23	......	......	......	360	495	845	360	380	100	90	......	......
24	......	......	......	360	680	845	360	360	90	90	......	......
25	......	......	......	415	560	610	360	360	90	70	......	......
26	......	......	......	360	635	560	380	360	80	70	......	......
27	......	......	......	415	560	495	360	360	70	70	......	......
28	......	......	......	360	495	415	322	340	80	45	......	......
29	......	......	......	360	495	415	322	322	80	35	......	......
30	......	......	......	360	495	432	322	300	70	15	......	......
31	......	......	......	......	300	......	340	275	......	10	......	......
Total	......	......	......	3700	15017	23752	12634	11097	6755	3570	......	......
Mean	......	......	......	264	484	792	408	358	225	115	......	......
Max.	......	......	......	415	742	1340	560	495	432	360	......	......
Min.	......	......	......	0	270	235	222	35	70	10	......	......
Acre-ft.	......	......	......	7330	29800	47100	25100	22000	13400	7070	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

UNCOMPAHGRE RIVER NEAR DELTA

Location.—At highway bridge on township line between Tps. 95 and 96, 2 miles south of Delta; no tributaries between the station and the mouth and no important tributaries for several miles upstream.

Records Available.—April 29, 1903, to December 18, 1913; March 8, 1915, to October 31, 1918.

Drainage Area.—1,130 square miles.

Gage.—Vertical staff.

Channel.—Extremely shifting.

Discharge Measurements.—Made from the bridge.

Winter Flow.—The flow is probably not materially affected by ice, although ice forms along the edges and slush ice frequently occurs. Observations are discontinued during the winter months.

Diversions.—The normal flow is diverted during the irrigation season by ditches above the station, so that the records represent largely return seepage water.

Accuracy.—Estimates only fair, or, for certain periods, possibly good, measurements being insufficient to permit use of indirect method for shifting channels to fullest extent.

Co-operation.—Records furnished by the United States Geological Survey.

CRYSTAL CREEK NEAR MAHER

Location.—In Sec. 35, T. 50 N., R. 6 W., at the old Kruemling ranch, 300 feet above headgate of Fruitland Irrigation Company's ditch, 8 miles southeast of Maher, in Montrose County. Nearest important tributary, North Fork, which enters one mile above.

Drainage Area.—............

Records Available.—April 6, 1917, to December 14, 1918.

Gage.—Vertical staff attached to downstream left abutment of highway bridge; read by C. B. Wray.

Discharge Measurements.—Made from bridge or by wading.

Channel and Control.—Channel of compact gravel; permanent control at small rapids of compact gravel, 40 feet downstream; slightly shifting during 1918. Banks will overflow at stage of 4.0 feet.

Extremes of Discharge.—Maximum stage recorded, 1.9 feet at 6 p. m., April 28 and 29, and 6 a. m., April 30 and May 11 (discharge, ... second-feet); minimum stage recorded.

Ice.—Stage-discharge relation seriously affected by ice; observations discontinued.

Diversions.—Above station, Cedar Canyon and Iron Springs ditch has adjudicated decree for 50 second-feet. Below, the Fruitland Irrigation Company's ditch diverts water into the Onion Valley reservoir.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of Uncompahgre River Near Delta for 1918.

Drainage Area, 1,130 Square Miles. Altitude, 4,970 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	69	99	59	85	95	167	......	......
2	......	......	......	......	52	67	58	74	90	125	......	......
3	......	......	......	......	37	116	87	76	95	115	......	......
4	......	......	......	......	150	140	102	85	90	50	......	......
5	......	......	......	......	140	215	150	77	120	40	......	......
6	......	......	......	......	163	202	92	87	100	125	......	......
7	......	......	......	......	190	335	103	97	70	78	......	......
8	......	......	......	......	138	315	140	99	77	59	......	......
9	......	......	......	......	115	230	170	109	100	140	......	......
10	......	......	......	......	100	277	185	107	337	146	......	......
11	......	......	......	......	85	575	152	308	440	152	......	......
12	......	......	......	......	93	357	335	187	535	160	......	......
13	......	......	......	......	75	485	78	166	400	156	......	......
14	......	......	......	......	67	910	126	335	315	160	......	......
15	......	......	......	......	69	855	125	125	290	144	......	......
16	......	......	......	......	109	705	100	66	288	280	......	......
17	......	......	......	......	95	540	100	38	250	200	......	......
18	......	......	......	......	150	345	88	59	203	167	......	......
19	......	......	......	......	87	315	85	67	171	174	......	......
20	......	......	......	......	50	425	97	85	172	225	......	......
21	......	......	......	......	90	460	121	100	176	308	......	......
22	......	......	......	177	58	505	100	93	174	250	......	......
23	......	......	......	123	123	1100	100	59	172	245	......	......
24	......	......	......	15	140	625	67	40	170	243	......	......
25	......	......	......	100	88	475	77	66	171	220	......	......
26	......	......	......	75	125	420	85	37	176	170	......	......
27	......	......	......	70	87	300	75	10	170	167	......	......
28	......	......	......	70	132	245	72	68	170	170	......	......
29	......	......	......	67	87	176	77	95	170	170	......	......
30	......	......	......	75	75	150	75	88	171	168	......	......
31	......	......	......	......	130	......	76	85	......	125	......	......
Total	......	......	......	772	3169	11964	3357	3073	5958	5099	......	......
Mean	......	......	......	85.8	102	399	108	99.1	199	164	......	......
Max.	......	......	......	177	190	1100	335	335	535	308	......	......
Min.	......	......	......	15	37	67	58	10	70	40	......	......
Acre-ft.	......	......	......	1530	6270	23700	6640	6090	11800	10100	......	......

Discharge of Uncompahgre River at Delta for 1917.

Drainage Area, 1,130 Square Miles. Altitude, 4,970 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	180	432	337	769	112	103	384	......	......
2	......	......	......	190	373	337	648	167	103	393	......	......
3	......	......	......	182	489	356	445	124	103	375	......	......
4	......	......	......	166	426	337	420	124	96	411	......	......
5	......	......	......	141	642	420	318	126	90	379	......	......
6	......	......	......	141	458	460	215	112	89	416	......	......
7	......	......	......	152	545	511	215	84	86	435	......	......
8	......	......	......	143	475	267	283	59	112	420	......	......
9	......	......	......	200	397	248	248	74	97	375	......	......
10	......	......	......	260	367	333	345	96	86	277	......	......
11	......	......	......	215	318	520	337	169	77	180	......	......
12	......	......	......	182	302	326	248	356	109	215	......	......
13	......	......	......	230	403	497	209	648	71	47	......	......
14	......	......	......	323	465	470	337	397	48	100	......	......
15	......	......	......	305	775	681	200	197	267	90	......	......
16	......	......	......	252	865	800	164	474	195	114	......	......
17	......	......	......	210	916	675	102	280	218	98	......	......
18	......	......	......	257	841	675	105	105	319	94	......	......
19	......	......	......	150	755	865	87	87	356	91	......	......
20	......	......	......	130	624	479	91	95	248	96	......	......
21	......	......	......	126	420	384	103	136	224	83	......	......
22	......	......	......	160	307	737	103	96	209	93	......	......
23	......	......	......	285	333	675	77	95	248	95	......	......
24	......	......	......	332	356	768	77	103	224	94	......	......
25	......	......	......	358	333	762	84	109	270	102	......	......
26	......	......	......	462	245	675	90	112	314	94	......	......
27	......	......	......	503	189	675	102	112	158	84	......	......
28	......	......	......	349	156	622	95	103	129	100	......	......
29	......	......	......	419	277	577	86	103	153	102	......	......
30	......	......	......	452	277	648	245	103	187	93	......	......
31	......	......	......	......	215	......	290	103	......	91	......	......
Total	......	......	......	7455	13976	16117	7138	5061	5089	6021	......	......
Mean	......	......	......	248	451	537	230	163	170	194	......	......
Max.	......	......	......	503	916	865	769	648	356	435	......	......
Min.	......	......	......	126	156	248	77	59	48	47	......	......
Acre-ft.	......	......	......	14800	27700	32000	14100	10000	10100	11900	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Crystal Creek Near Maher for 1917.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	53	136	107	0.5	0.1	15	8	......
2	......	......	......	......	56	171	84	0.5	0.1	15	7	......
3	......	......	......	......	52	206	56	0.4	0.1	15	7	......
4	......	......	......	......	51	197	47	0.4	0.2	15	6	......
5	......	......	......	......	53	267	24	0.4	0.2	15	5	......
6	......	......	......	6	53	280	19	0.4	0.2	15	5	......
7	......	......	......	6	53	241	15	0.4	0.2	14	5	......
8	......	......	......	6	62	269	12	0.4	0.2	14	5	......
9	......	......	......	7	62	399	13	0.4	0.4	14	5	......
10	......	......	......	7	71	405	10	0.4	0.5	14	5	......
11	......	......	......	9	82	387	10	0.4	1	14	5	......
12	......	......	......	16	125	371	12	0.4	2	14	5	......
13	......	......	......	26	149	395	9	0.4	2	14	5	......
14	......	......	......	31	149	399	9	0.4	2	13	5	......
15	......	......	......	22	171	365	7	0.4	2	12	5	......
16	......	......	......	14	249	307	5	0.3	5	12	5	......
17	......	......	......	14	297	307	5	0.3	8	12	5	......
18	......	......	......	14	332	302	3	0.2	8	12	5	......
19	......	......	......	14	327	293	2	0.2	9	12	5	......
20	......	......	......	13	161	292	0.6	0.2	9	12	5	......
21	......	......	......	16	155	297	0.5	0.2	9	12	5	......
22	......	......	......	42	149	292	0.5	0.2	9	12	5	......
23	......	......	......	63	141	281	0.5	0.2	9	12	5	......
24	......	......	......	99	126	267	0.8	0.2	9	12	5	......
25	......	......	......	187	131	259	0.5	0.2	9	11	5	......
26	......	......	......	155	125	245	0.4	0.2	9	10	5	......
27	......	......	......	94	123	225	0.5	0.2	12	9	5	......
28	......	......	......	71	125	216	0.8	0.2	15	9	5	......
29	......	......	......	70	131	205	0.8	0.2	15	9	5	......
30	......	......	......	62	129	173	0.6	0.2	15	8	5	......
31	......	......	......	......	139	......	0.6	0.1	......	8	......	......
Total	......	......	......	1064	4082	8449	456.1	9.5	161.2	385	158	......
Mean	......	......	......	42.6	132	282	14.7	0.31	5.37	12.4	5.3	......
Max.	......	......	......	187	332	405	107	0.5	15	15	8	......
Min.	......	......	......	6	51	136	0.4	0.1	0.1	8	5	......
Acre-ft.	......	......	......	2110	8120	16800	904	19	320	762	315	......

Discharge of Crystal Creek Near Maher for 1918.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	46	132	105	2	2	4	7	8	3
2	......	......	......	63	116	100	2	1	4	6	8	3
3	......	......	12	76	100	108	2	1	49	6	8	3
4	......	......	15	76	86	111	2	2	11	5	10	3
5	......	......	15	84	72	121	2	2	7	5	10	3
6	......	......	18	84	72	108	6	2	6	4	11	3
7	......	......	19	84	108	100	10	2	6	7	8	4
8	......	......	18	70	140	82	8	2	6	6	8	4
9	......	......	22	57	157	76	8	2	5	5	8	3
10	......	......	22	51	157	56	8	0	5	7	8	3
11	......	......	12	51	157	69	6	0	5	6	7	3
12	......	......	5	35	134	64	6	0	4	5	8	3
13	......	......	7	40	137	60	6	0	4	5	8	3
14	......	......	5	46	116	60	6	0	5	5	4	3
15	......	......	12	51	111	69	6	0	4	5	4	......
16	......	......	22	70	127	96	5	1	4	6	4	......
17	......	......	22	84	124	76	5	0	4	6	4	......
18	......	......	26	99	121	54	5	0	4	6	4	......
19	......	......	35	99	111	37	4	0	4	6	4	......
20	......	......	51	91	100	30	4	0	4	5	4	......
21	......	......	51	84	111	26	4	0	4	6	4	......
22	......	......	46	99	108	18	4	0	4	6	4	......
23	......	......	35	139	96	14	3	0	5	6	4	......
24	......	......	51	139	76	5	3	0	6	6	4	......
25	......	......	51	139	56	2	2	2	6	6	4	......
26	......	......	63	147	66	2	1	3	6	6	4	......
27	......	......	70	163	86	2	1	3	7	4	4	......
28	......	......	63	171	90	2	2	3	7	4	3	......
29	......	......	63	171	96	2	2	4	7	6	3	......
30	......	......	51	163	93	2	2	4	7	6	3	......
31	......	......	40	......	96	......	2	4	......	8	......	......
Total	......	......	922	2772	3352	1657	129	40	204	177	175	44
Mean	......	......	31.8	92.4	108	55.2	4.2	1.3	6.8	5.7	5.8	3.1
Max.	......	......	70	171	157	121	10	4.0	49	8	11	4
Min.	......	......	5	35	56	2	1	0	4	4	3	3
Acre-ft.	......	......	1830	5500	6640	3280	258	80	405	350	345	86

Unless otherwise noted, all discharges are in cubic feet per second.

LEROUX CREEK NEAR LAZEAR

Location.—In Sec. 33, T. 13 S., R. 93 W., at highway bridge, about 8 miles north of Lazear, in Delta County. No important tributary within several miles.

Drainage Area.—52 square miles (measured on Forest atlas).

Records Available.—May 15, 1917, to November 30, 1918.

Gage.—Lallie water-stage recorder installed April 23, 1918, and referred to vertical staff fastened to face of left bridge abutment; July 20, 1917, datum lowered 0.40 foot; read by G. H. Henderson.

Discharge Measurements.—Made from single-span bridge or by wading.

Channel and Control.—Channel composed of gravel and boulders; very rough. Control 50 feet downstream, somewhat shifting during 1918.

Diversions.—Court decrees for diversions of 55 second-feet from Leroux Creek above station, of which 33 second-feet are for diversion out of the drainage basin. Below, adjudicated decrees for 290 second-feet.

Co-operation.—Station is maintained in co-operation with the United States Geological Survey.

SURFACE CREEK AT CEDAREDGE

Location.—About Sec. 29, T. 13 S., R. 94 W., at Cedaredge, in Delta County. Nearest tributary, Mill Creek, enters 4 miles above.

Drainage Area.—43 square miles.

Records Available.—May 16, 1917, to November 30, 1918.

Gage.—Lallie water-stage recorder referred to vertical staff fastened to right concrete abutment of footbridge 400 feet upstream from highway bridge in Cedaredge.

Discharge Measurements.—Made from footbridge at gage section.

Channel and Control.—Channel of small boulders filled in behind control which is old concrete weir filled up flush with boulders and gravel, located 12 feet downstream. Control permanent. Above stage 0.7 foot water flows through an overflow channel which may shift somewhat.

Diversions.—Adjudicated decrees for diversions of 142 second-feet from Surface Creek above station of which 67 second-feet are for diversion out of the drainage basin. Below, adjudicated decrees for 272 second-feet.

Co-operation.—Station is maintained in co-operation with the United States Geological Survey.

Discharge of Leroux Creek Near Lazear for 1917.

Drainage Area, 52 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	90	......	......	......	......	......	......
2	......	......	......	......	......	90	......	......	......	......	......	......
3	......	......	......	......	......	175	......	......	......	......	......	......
4	......	......	......	......	......	380	......	......	......	......	......	......
5	......	......	......	......	......	332	......	......	......	......	......	......
6	......	......	......	......	......	310	......	......	......	......	......	......
7	......	......	......	......	......	405	......	......	......	......	......	......
8	......	......	......	......	......	520	......	......	......	......	......	......
9	......	......	......	......	......	840	......	......	......	......	......	......
10	......	......	......	......	......	805	......	......	......	......	......	......
11	......	......	......	......	......	1060	......	......	......	......	......	......
12	......	......	......	......	......	1100	......	......	......	......	......	......
13	......	......	......	......	......	948	......	......	......	......	......	......
14	......	......	......	......	......	875	......	......	......	......	......	......
15	......	......	......	......	246	1020	......	......	......	......	......	......
16	......	......	......	......	260	1020	......	......	......	......	......	......
17	......	......	......	......	275	1300	......	......	......	......	......	......
18	......	......	......	......	290	1220	......	......	......	......	......	......
19	......	......	......	......	310	1160	......	......	......	......	......	......
20	......	......	......	......	286	1080	59	......	......	......	......	......
21	......	......	......	......	263	1060	......	......	......	......	......	......
22	......	......	......	......	266	1100	......	......	......	......	......	......
23	......	......	......	......	270	1020	......	......	......	......	......	......
24	......	......	......	......	270	948	......	......	......	......	......	......
25	......	......	......	......	235	875	......	......	......	......	......	......
26	......	......	......	......	126	750	......	......	......	......	......	......
27	......	......	......	......	126	705	......	......	......	......	......	......
28	......	......	......	......	101	298	......	......	......	......	......	......
29	......	......	......	......	77	282	......	......	......	......	......	......
30	......	......	......	......	88	282	......	......	......	......	......	......
31	......	......	......	......	83	......	......	......	......	......	......	......
Total	......	......	......	......	3572	22050	......	......	......	......	......	......
Mean....	......	......	......	......	210	735	......	......	......	......	......	......
Max.	......	......	......	......	310	1300	......	......	......	......	......	......
Min.......	......	......	......	......	77	90	......	......	......	......	......	......
Acre-ft.	......	......	......	......	7080	43700	......	......	......	......	......	......

Discharge of Leroux Creek Near Lazear for 1918.

Drainage Area, 52 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	112	134	26	14	2.9	2.8	1.9	......
2	......	......	......	......	96	176	27	14	3.9	2.7	2.2	......
3	......	......	......	......	79	233	33	13	4.8	2.6	2.0	......
4	......	......	......	......	158	260	51	14	9.6	2.6	1.9	......
5	......	......	......	......	236	187	32	20	11	2.5	2.0	......
6	......	......	......	......	284	169	31	18	7.0	2.5	2.1	......
7	......	......	......	......	316	158	41	15	3.4	2.4	1.9	......
8	......	......	......	......	277	164	26	10	3.4	2.4	2.2	......
9	......	......	......	......	205	169	24	10	5.6	2.4	2.2	......
10	......	......	......	......	163	174	35	12	39	2.5	2.2	......
11	......	......	......	......	105	171	31	11	18	9.6	2.1	......
12	......	......	......	......	110	154	27	10	5.9	4.8	2.0	......
13	......	......	......	......	115	136	28	9.6	4.4	2.1	2.0	......
14	......	......	......	......	246	119	27	16	2.9	2.3	2.0	......
15	......	......	......	......	565	110	30	19	2.6	2.1	2.2	......
16	......	......	......	......	665	85	31	20	2.7	2.0	2.0	......
17	......	......	......	......	550	75	34	16	2.6	1.9	2.0	......
18	......	......	......	......	352	77	26	8.8	2.6	1.8	3.4	......
19	......	......	......	......	438	125	28	10	2.6	1.6	2.5	......
20	......	......	......	......	266	134	30	12	2.6	1.7	2.2	......
21	......	......	......	......	291	119	32	14	2.6	2.6	2.2	......
22	......	......	......	......	316	110	36	12	2.6	2.5	2.2	......
23	......	......	......	42	305	128	34	8.4	2.6	2.7	2.3	......
24	......	......	......	50	277	154	35	5.6	4.2	2.5	2.7	......
25	......	......	......	72	260	85	34	4.2	3.8	2.3	2.8	......
26	......	......	......	74	224	67	23	4.0	3.0	2.1	2.8	......
27	......	......	......	70	224	52	20	3.6	2.8	2.1	3.0	......
28	......	......	......	88	243	39	12	3.2	2.9	2.1	3.2	......
29	......	......	......	85	249	31	12	2.9	2.9	2.0	3.2	......
30	......	......	......	117	176	28	12	2.8	2.8	1.9	3.2	......
31	......	......	......	......	128	......	14	2.8	......	2.1	......	......
Total	......	......	......	598	8031	3823	882	335.9	167.7	80.2	70.6	......
Mean....	......	......	......	74.8	259	127	28.5	10.8	5.59	2.59	2.35	......
Max.	......	......	......	......	665	260	51	20	39	9.6	3.4	......
Min.......	......	......	......	......	79	28	12	2.8	2.6	1.6	1.9	......
Acre-ft.	......	......	......	1190	15900	7560	1750	664	333	159	140	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Surface Creek at Cedaredge for 1917.

Drainage Area, 43 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	106	226	35	40	2.0	2.9	......
2	......	......	......	......	......	125	188	33	32	1.6	2.9	......
3	......	......	......	......	......	210	159	31	18	1.6	3.2	......
4	......	......	......	......	......	243	138	32	22	1.6	3.5	......
5	......	......	......	......	......	265	130	28	16	1.6	3.5	......
6	......	......	......	......	......	278	115	29	16	1.6	3.2	......
7	......	......	......	......	......	324	110	22	15	1.6	3.2	......
8	......	......	......	......	......	346	108	24	13	1.6	2.9	......
9	......	......	......	......	......	410	128	21	9	1.8	3.2	......
10	......	......	......	......	......	394	138	22	8	2.0	3.2	......
11	......	......	......	......	......	394	159	15	14	2.3	3.2	......
12	......	......	......	......	......	370	150	15	14	2.6	......	......
13	......	......	......	......	......	378	141	15	12	3.2	......	......
14	......	......	......	......	......	362	108	15	12	3.2	......	......
15	......	......	......	......	......	394	110	15	11	3.2	......	......
16	......	......	......	......	304	362	104	14	9	3.2	......	......
17	......	......	......	......	330	378	106	13	8	3.2	......	......
18	......	......	......	......	338	410	86	12	7	3.2	......	......
19	......	......	......	......	254	410	75	12	6	3.2	......	......
20	......	......	......	......	201	362	82	11	5	3.5	......	......
21	......	......	......	......	174	317	84	17	4	3.5	......	......
22	......	......	......	......	232	362	75	26	3	3.5	......	......
23	......	......	......	......	165	410	82	52	2	3.2	......	......
24	......	......	......	......	170	550	77	54	2	2.6	......	......
25	......	......	......	......	147	455	68	52	2	2.6	......	......
26	......	......	......	......	135	378	64	52	2	2.6	......	......
27	......	......	......	......	135	346	48	52	2	3.2	......	......
28	......	......	......	......	138	346	39	48	1	3.2	......	......
29	......	......	......	......	135	278	34	56	1	3.2	......	......
30	......	......	......	......	122	254	35	45	1	3.2	......	......
31	......	......	......	......	118	......	39	42	......	3.2	......	......
Total	......	......	......	......	3098	10217	3206	916	307	81.8	34.9	......
Mean	......	......	......	......	194	341	103	29.5	10.2	2.64	3.17	......
Max.	......	......	......	......	338	550	226	56	40	3.5	3.5	......
Min.	......	......	......	......	118	106	34	11	1	1.6	2.9	......
Acre-ft.	......	......	......	......	6160	20300	6330	1810	607	162	69.1	......

Discharge of Surface Creek at Cedaredge for 1918.

Drainage Area, 43 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	5.0	75	68	40	31	7.4	......	3.0	......
2	......	......	......	5.4	64	84	40	26	9.0	......	3.0	......
3	......	......	......	4.4	77	84	40	27	......	......	3.2	......
4	......	......	......	3.5	132	84	42	27	......	......	3.2	......
5	......	......	......	3.2	141	88	44	23	......	......	2.9	......
6	......	......	......	2.9	141	82	45	19	......	......	3.2	......
7	......	......	......	3.8	141	82	61	19	......	......	2.9	......
8	......	......	......	5.4	128	71	45	17	......	......	4.1	......
9	......	......	......	11	110	59	44	15	......	......	3.8	......
10	......	......	......	9.8	106	48	69	13	......	......	3.2	......
11	......	......	......	22	98	62	71	11	......	......	2.6	......
12	......	......	......	20	98	80	66	8.6	......	......	2.3	......
13	......	......	......	23	141	86	62	8.2	......	......	2.3	......
14	......	......	......	18	165	86	52	11	......	......	2.0	......
15	......	......	......	15	183	80	45	7.4	......	......	2.0	......
16	......	......	......	17	190	78	39	5.8	......	......	2.0	......
17	......	......	......	12	155	84	51	8.6	......	......	2.0	......
18	......	......	......	11	135	88	39	9.0	......	......	2.0	......
19	......	......	......	11	140	88	35	9.8	......	......	2.6	......
20	......	......	......	9	115	86	38	11	......	......	3.2	......
21	......	......	......	20	130	80	37	11	......	......	3.5	......
22	......	......	......	35	140	75	34	11	......	......	3.3	......
23	......	......	......	51	130	82	24	12	......	......	3.0	......
24	......	......	......	57	115	75	17	12	......	......	2.5	......
25	......	......	......	61	100	62	19	13	......	......	2.5	......
26	......	......	......	46	95	57	26	9.8	......	......	3.0	......
27	......	......	......	32	90	45	31	7.8	......	......	3.0	......
28	......	......	......	28	94	42	25	7.4	......	......	3.0	......
29	......	......	......	42	96	40	23	8.6	......	......	3.0	......
30	......	......	......	57	75	42	......	5.0	......	......	3.0	......
31	......	......	......	......	66	......	38	......	......	......	......	......
Total	......	......	......	641.4	3666	2168	1272	418.0	......	......	85.3	......
Mean	......	......	......	21.4	118	72.3	41.0	13.5	......	......	2.48	......
Max.	......	......	......	61	190	88	71	31	......	......	4.1	......
Min.	......	......	......	2.9	64	40	17	5.0	......	......	2.0	......
Acre-ft.	......	......	......	1270	7260	4300	2520	830	......	......	169	......

Unless otherwise noted, all discharges are in cubic feet per second.

KANNAH CREEK NEAR WHITEWATER

Location.—In Sec. 34, T. 12 S., R. 97 W., a quarter of a mile below intake for water supply of Grand Junction, and 17 miles southwest of Whitewater, in Mesa County. Nearest tributary, Coal Creek, enters short distance above station.

Drainage Area.—38 square miles (measured on Forest atlas).

Records Available.—October 15, 1917, to November 30, 1918.

Gage.—Vertical staff, located at right bank 300 feet above footbridge; read by James Woods.

Discharge Measurements.—Made by wading or from cable near gage.

Channel and Control.—Bed composed of gravel and small boulders; will shift. Control located at riffle of small boulders 75 feet downstream; will shift during high water.

Extremes of Stage.—Maximum stage recorded during year, 2.74 feet at 6 p. m., May 23. Minimum stage recorded, 0.16 foot at 8 a. m., December 7 and 8.

Ice.—Stage-discharge relation not affected by ice, except for short periods.

Diversions.—City of Grand Junction diverts an average of 4 second-feet above station for domestic use; maximum diversion, 7.8 second-feet.

Regulation.—Diurnal fluctuation in spring from alternate melting and freezing of mountain snow. No artificial regulation.

Combined Flow.—Flow diverted by city intake measured by weir and flow added to that at gaging station to show total flow of creek.

Co-operation.—Station maintained in conjunction with United States Geological Survey.

DOLORES RIVER AT BEDROCK

Location.—In Sec. 17, T. 47 N., R. 18 W., at highway bridge at Bedrock, Montrose County. Nearest perennial tributary, West Paradox Creek, enters below station.

Drainage Area.—1910 square miles (measured on Colo. Geol. Survey map, scale 1:500,000).

Records Available.—April 26 to November 22, 1918.

Gage.—Chain attached to up-stream side of bridge; read by Henry Dockery.

Discharge Measurements.—Made from single-span bridge or by wading.

Channel and Control.—Bed of stream composed of compact sand and silt which was apparently permanent during 1918; no well-defined control.

Co-operation.—Station is maintained in co-operation with the United State Geological Survey.

Discharge of Kannah Creek Near Whitewater for 1917.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	......	......	......	......	......	8.2	7.4
2	......	......	......	......	......	......	......	......	......	......	8.2	6.4
3	......	......	......	......	......	......	......	......	......	......	8.2	7.0
4	......	......	......	......	......	......	......	......	......	......	6.4	4.0
5	......	......	......	......	......	......	......	......	......	......	6.4	4.6
6	......	......	......	......	......	......	......	......	......	......	6.4	3.8
7	......	......	......	......	......	......	......	......	......	......	6.7	1.6
8	......	......	......	......	......	......	......	......	......	......	6.1	1.4
9	......	......	......	......	......	......	......	......	......	......	4.6	2.0
10	......	......	......	......	......	......	......	......	......	......	4.6	3.0
11	......	......	......	......	......	......	......	......	......	......	4.6	3.2
12	......	......	......	......	......	......	......	......	......	......	5.2	5.8
13	......	......	......	......	......	......	......	......	......	......	4.3	6.4
14	......	......	......	......	......	......	......	......	......	......	4.3	5.8
15	......	......	......	......	......	......	......	......	......	......	5.2	5.8
16	......	......	......	......	......	......	......	......	......	......	4.9	5.8
17	......	......	......	......	......	......	......	......	......	......	4.9	5.8
18	......	......	......	......	......	......	......	......	......	......	4.9	5.8
19	......	......	......	......	......	......	......	......	......	......	4.9	5.8
20	......	......	......	......	......	......	......	......	......	......	4.9	6.4
21	......	......	......	......	......	......	......	......	......	8.6	4.9	6.4
22	......	......	......	......	......	......	......	......	......	8.6	4.9	6.4
23	......	......	......	......	......	......	......	......	......	8.6	4.9	6.4
24	......	......	......	......	......	......	......	......	......	8.6	4.3	6.4
25	......	......	......	......	......	......	......	......	......	8.6	4.0	6.4
26	......	......	......	......	......	......	......	......	......	8.6	5.5	6.1
27	......	......	......	......	......	......	......	......	......	8.6	6.7	6.4
28	......	......	......	......	......	......	......	......	......	7.8	6.4	6.7
29	......	......	......	......	......	......	......	......	......	3.6	7.4	7.0
30	......	......	......	......	......	......	......	......	......	4.9	7.0	6.7
31	......	......	......	......	......	......	......	......	......	6.4	......	6.7
Total	......	......	......	......	......	......	......	......	......	82.9	169.9	169.4
Mean	......	......	......	......	......	......	......	......	......	7.54	5.66	5.46
Max.	......	......	......	......	......	......	......	......	......	8.6	8.2	7.4
Min.	......	......	......	......	......	......	......	......	......	3.6	4.0	1.4
Acre-ft.	......	......	......	......	......	......	......	......	......	165	337	336

Discharge of Kannah Creek Near Whitewater for 1918.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6.7	6.4	7.0	11	18	165	50	21	18	10	10	......
2	6.7	6.4	7.0	12	23	162	43	21	16	10	10	......
3	7.0	6.4	7.0	13	28	153	38	19	16	10	10	......
4	7.0	6.4	7.0	13	31	137	36	18	28	10	10	......
5	7.0	6.4	7.0	13	35	137	33	18	34	11	10	......
6	7.0	6.4	7.0	13	37	129	30	18	40	11	10	......
7	6.7	6.4	7.0	13	38	126	34	18	25	11	10	......
8	6.7	6.4	6.7	13	81	105	34	17	20	11	10	......
9	6.4	6.4	7.0	14	124	101	32	18	16	11	10	......
10	6.1	6.4	7.0	14	167	92	32	18	16	11	10	......
11	5.0	6.4	7.0	13	210	82	34	16	16	11	10	......
12	4.0	6.4	5.5	14	252	80	34	15	16	11	10	......
13	3.0	6.4	4.6	16	255	75	34	15	15	11	10	......
14	2.7	6.4	5.8	16	252	67	31	16	14	11	7.8	......
15	2.4	6.4	6.7	17	252	61	31	18	14	10	7.0	......
16	2.5	6.4	7.0	17	252	63	31	16	14	10	10	......
17	2.8	6.4	6.7	15	249	47	31	15	14	10	10	......
18	3.0	6.4	7.4	11	288	41	31	11	13	10	11	......
19	4.0	6.4	7.8	7.4	219	40	31	11	13	10	11	......
20	5.0	6.4	7.8	8.6	202	61	31	11	13	10	11	......
21	6.4	6.4	7.8	13	231	74	31	11	13	11	11	......
22	6.4	6.4	7.8	13	294	80	31	11	12	11	11	......
23	6.7	6.4	7.8	15	336	80	31	10	12	11	11	......
24	7.0	6.4	8.2	16	288	77	31	10	12	11	11	......
25	6.7	6.4	8.2	17	255	72	31	11	11	10	11	......
26	7.0	6.4	8.6	18	252	69	31	12	11	10	11	......
27	6.7	6.4	9.4	19	231	64	31	16	11	11	11	......
28	6.4	7.0	9.4	13	213	60	27	21	10	11	11	......
29	6.4	......	10	16	210	56	25	22	10	11	11	......
30	6.4	......	11	17	202	52	22	22	10	11	11	......
31	6.4	......	12	......	190	......	22	20	......	10	......	......
Total	174.2	179.8	236.2	421	5715	2608	994	496	483	328	307.8	......
Mean	5.62	6.42	7.62	14.0	184	86.9	32.1	16.0	16.1	10.6	10.3	......
Max.	7.0	7.0	12	19	336	165	50	22	40	11	11	......
Min.	2.4	6.4	4.6	7.4	18	40	22	10	10	10	7	......
Acre-ft.	346	357	469	833	11300	5170	1970	984	958	652	613	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Dolores River at Bedrock, Colo., for 1918.

Drainage Area, 1,910 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	560	560	197	25	25	6	25	......
2	......	......	......	......	580	410	154	25	25	6	16	......
3	......	......	......	......	560	365	144	25	25	6	16	......
4	......	......	......	......	600	600	124	31	208	6	25	......
5	......	......	......	......	600	890	104	134	59	6	25	......
6	......	......	......	......	820	1380	325	59	25	6	16	......
7	......	......	......	......	990	1320	197	44	31	6	25	......
8	......	......	......	......	1060	1290	144	25	25	16	31	......
9	......	......	......	......	775	990	208	31	20	16	37	......
10	......	......	......	......	730	1090	275	25	16	16	37	......
11	......	......	......	......	940	1290	300	94	20	16	37	......
12	......	......	......	......	820	1430	600	59	20	16	37	......
13	......	......	......	......	640	1350	865	37	230	16	25	......
14	......	......	......	......	462	1220	410	25	154	25	25	......
15	......	......	......	......	580	1240	365	31	94	25	37	......
16	......	......	......	......	1190	1090	241	25	67	25	37	......
17	......	......	......	......	1430	890	176	25	44	44	44	......
18	......	......	......	......	1460	730	134	25	31	37	51	......
19	......	......	......	......	1460	620	104	25	25	25	51	......
20	......	......	......	......	1350	500	124	25	20	25	44	......
21	......	......	......	......	1400	462	94	25	16	37	37	......
22	......	......	......	......	1020	752	59	25	16	20	37	......
23	......	......	......	......	842	730	51	25	10	16	......	......
24	......	......	......	......	1060	1460	51	25	10	16	......	......
25	......	......	......	......	1260	1040	51	25	10	20	......	......
26	......	......	......	395	1060	708	51	25	10	20	......	......
27	......	......	......	462	1040	462	44	25	6	16	......	......
28	......	......	......	480	965	325	31	25	6	16	......	......
29	......	......	......	445	915	252	25	25	6	16	......	......
30	......	......	......	445	842	208	25	25	6	16	......	......
31	......	......	......	......	708	......	25	25	......	20	......	......
Total	......	......	......	2227	28719	25654	5698	1070	1260	557	715	......
Mean	......	......	......	......	926	855	184	34.5	42.0	18.0	32.5	......
Max.	......	......	......	......	1460	1460	865	134	230	44	......	......
Min.	......	......	......	......	462	208	25	25	6	6	......	......
Acre-ft.	......	......	......	4410	56900	50900	11300	2120	2500	1110	1420	......

Unless otherwise noted, all discharges are in cubic feet per second.

NORTH AND SOUTH PLATTE DRAINAGES

R. G. Hosea, Hydrographer

MIDDLE FORK SOUTH PLATTE RIVER AT FAIRPLAY

Location.—Located at highway bridge in town of Fairplay.

Records Available.—May 1, 1916, to October 27, 1917.

Drainage Area.—82.3 square miles.

Channel.—Rough, but probably permanent.

Gage.—Vertical staff gage.

Records furnished by Frank Adams, Denver, Colo.

Station abandoned after October 22, 1917.

NORTH FORK OF SOUTH PLATTE RIVER AT GRANT

Location.—At Grant postoffice, in Sec. 9, T. 7 S., R. 74 W., in the Pike National Forest, 250 feet above the mouth of Geneva Creek.

Records Available.—July 18, 1910, to September 30, 1917.

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge Measurements.—Made from footbridge and by wading.

Winter Flow.—Ice causes backwater during the winter months and measurements are made to determine the flow.

Diversions.—There are court decrees for diversions of 5.5 second-feet from the North Fork above the station, and there are decrees for diversions of 24 second-feet from the tributaries entering above.

Accuracy.—Though the channel is somewhat shifting, sufficient measurements were obtained to make estimates reliable.

Co-operation.—Station maintained in co-operation with the United States Geological Survey.

Station abandoned after September 30, 1917.

Discharge of Middle Fork of South Platte River at Fairplay for 1917.
Drainage Area, 82.3 Square Miles. Altitude, 9,900 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	66	300	123	36	29	......	......
2	......	......	......	......	......	66	284	123	36	24	......	......
3	......	......	......	......	......	66	269	123	36	24	......	......
4	......	......	......	......	24	102	254	102	29	18	......	......
5	......	......	......	......	24	112	254	92	29	18	......	......
6	......	......	......	......	10	112	239	92	29	10	......	......
7	......	......	......	......	14	134	254	92	36	10	......	......
8	......	......	......	......	24	123	300	74	36	10	......	......
9	......	......	......	......	24	210	332	74	36	18	......	......
10	......	......	......	......	24	365	332	74	36	18	......	......
11	......	......	......	......	24	348	284	74	29	18	......	......
12	......	......	......	......	36	316	239	74	29	18	......	......
13	......	......	......	......	36	365	254	83	36	10	......	......
14	......	......	......	......	43	400	239	88	43	10	......	......
15	......	......	......	......	74	456	210	92	43	10	......	......
16	......	......	......	......	102	437	224	92	43	10	......	......
17	......	......	......	......	112	475	196	112	43	10	......	......
18	......	......	......	......	145	437	182	102	29	18	......	......
19	......	......	......	......	170	400	182	92	29	43	......	......
20	......	......	......	......	145	418	210	83	29	43	......	......
21	......	......	......	......	102	332	196	88	29	36	......	......
22	......	......	......	......	92	332	182	74	29	29	......	......
23	......	......	......	......	66	332	182	58	29	24	......	......
24	......	......	......	......	66	332	182	58	29	24	......	......
25	......	......	......	......	66	332	224	50	29	10	......	......
26	......	......	......	......	66	300	210	50	29	36	......	......
27	......	......	......	......	58	300	182	50	29	43	......	......
28	......	......	......	......	74	300	182	50	29	......	......	......
29	......	......	......	......	50	300	169	50	29	......	......	......
30	......	......	......	......	66	300	169	50	29	......	......	......
31	......	......	......	......	66	......	134	50	......	......	......	......
Total	......	......	......	......	1803	8568	7050	2479	982	571	......	......
Mean	......	......	......	......	64.4	286	228	80	32.7	21.2	......	......
Max.	......	......	......	......	......	475	332	123	43	......	......	......
Min.	......	......	......	......	......	66	134	50	29	......	......	......
Acre-ft.	......	......	......	......	3580	17000	14000	4920	1950	1140	......	......

Discharge of North Fork South Platte River at Grant for 1917.
Drainage Area, 49 Square Miles. Altitude, 8,566 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	0.5	13	75	129	50	17	......	......	......
2	......	......	......	0.4	14	84	122	46	16	......	......	......
3	......	......	......	0.4	11	86	122	44	13	......	......	......
4	......	......	......	0.6	11	88	107	41	14	......	......	......
5	......	......	......	0.8	11	95	107	40	15	......	......	......
6	......	......	......	0.4	20	95	100	38	13	......	......	......
7	......	......	......	0.4	19	96	93	38	14	......	......	......
8	......	......	......	11	17	132	100	31	13	......	......	......
9	......	......	......	14	20	148	122	34	13	......	......	......
10	......	......	......	13	17	218	107	31	13	......	......	......
11	......	......	......	12	15	218	100	31	12	......	......	......
12	......	......	......	11	20	202	92	29	12	......	......	......
13	......	......	......	11	28	220	88	35	12	......	......	......
14	......	......	......	11	42	186	82	29	14	......	......	......
15	......	......	......	8.2	50	195	64	26	13	......	......	......
16	......	......	......	8.2	53	195	68	28	12	......	......	......
17	......	......	......	7.0	68	195	70	26	12	......	......	......
18	......	......	......	8.8	79	195	68	26	11	......	......	......
19	......	......	......	7.0	86	186	68	26	11	......	......	......
20	......	......	......	7.0	76	177	67	25	11	......	......	......
21	......	......	......	12	79	177	65	23	11	......	......	......
22	......	......	......	22	73	161	62	22	10	......	......	......
23	......	......	......	26	67	161	61	22	9	......	......	......
24	5.6	......	......	23	69	161	61	22	9	......	......	......
25	......	......	......	22	70	161	76	20	8	......	......	......
26	......	5.8	......	21	69	153	70	19	8	......	......	......
27	......	......	......	20	57	145	61	19	8	......	......	......
28	......	......	......	14	69	145	55	20	8	......	......	......
29	......	......	......	15	68	145	57	19	8	......	......	......
30	......	......	......	26	69	129	62	19	8	......	......	......
31	......	......	......	......	73	......	54	17	......	......	......	......
Total	......	......	......	333.7	1433	4624	2560	896	348	......	......	......
Mean	......	......	......	11.1	46.2	154	82.6	28.9	11.6	......	......	......
Max	......	......	......	26	86	220	129	50	17	......	......	......
Min	......	......	......	0.4	11	75	54	17	8	......	......	......
Acre-ft.	......	......	......	660	2840	9160	5080	1780	690	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

SOUTH FORK OF SOUTH PLATTE RIVER AT LAKE GEORGE

Location.—At highway bridge in Sec. 19, T. 12 S., R. 71 W., one-fourth mile below Lake George, in the Pike National Forest, about 2 miles above the mouth of Caylor Gulch; no tributary between the outlet of the lake and the station.

Records Available.—October 22, 1910, to November 30, 1918.

Drainage Area.—1,070 square miles.

Gage.—Automatic recording gage installed in 1911, reading to the same datum as the original staff gage.

Channel.—Conditions in the channel will remain unchanged as long as the control for the station—a 2-foot timber-crib dam 50 feet below the gage—remains permanent.

Discharge Measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter Flow.—Ice causes backwater during the winter months and measurements are made to determine the flow.

Regulation.—The discharge at the station is regulated to some extent by the Antero Reservoir, located about 35 miles above, and by Lake George.

Diversions.—There are court decrees for diversions of 1,076 second-feet from South Fork above this station and for diversions of 1,816 second-feet from tributaries entering above.

Accuracy.—Results are considered fair.

Co-operation.—Station maintained in co-operation with United States Forest Service and the United States Geological Survey.

NORTH FORK OF SOUTH PLATTE AT SOUTH PLATTE

Location.—In Sec. 25, T. 7 S., R. 70 W., one-third mile above South Platte. No tributary between station and mouth at South Platte.

Records Available.—January 4, 1909, to September 30, 1910; April 1, 1913, to November 30, 1918.

Drainage Area.—450 square miles.

Gage.—Inclined staff whose datum has remained unchanged.

Channel.—Somewhat shifting.

Discharge Measurements.—Made from car and cable during high and medium stages, and by wading at low stages.

Winter Flow.—Ice causes backwater and discharge measurements are made to determine the flow.

Diversions.—There are court decrees for diversions of 20 second-feet from North Fork between Grant and South Platte, and 62 second-feet from intervening tributaries, exclusive of Geneva Creek. There are also a number of small ice and fish ponds which divert small amounts of water at various times.

Accuracy.—Records considered good.

Co-operation.—Station maintained in co-operation with the United States Geological Survey.

Discharge of South Fork South Platte River at Lake George for 1917.
Drainage Area, 1,070 Square Miles. Altitude, 7,963 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	0	29	170	207	244	42	24	......
2	......	......	......	......	0	36	154	108	207	42	19	......
3	......	......	......	......	4	398	154	170	207	42	12	......
4	......	......	......	......	36	80	122	154	207	42	16	......
5	......	......	......	......	36	19	94	122	188	42	24	......
6	......	......	......	......	29	29	59	264	188	42	29	......
7	......	......	......	......	29	29	59	284	188	42	24	......
8	......	......	......	......	29	24	59	284	207	42	24	......
9	......	......	......	......	29	19	244	306	225	42	24	......
10	......	......	......	......	29	10	478	284	207	42	24	......
11	......	......	......	......	29	29	478	284	207	42	24	......
12	......	......	......	......	29	108	373	284	188	42	24	......
13	......	......	......	......	36	94	264	306	170	42	24	......
14	......	......	......	......	50	94	170	327	137	36	19	......
15	......	......	......	108	50	108	137	450	108	36	19	......
16	......	......	......	94	50	137	137	373	29	36	19	......
17	......	......	......	94	36	284	108	373	10	29	19	......
18	......	......	......	94	36	373	108	327	42	29	19	......
19	......	......	......	108	36	398	327	284	59	29	19	......
20	......	......	......	80	59	350	423	244	80	24	19	......
21	......	......	......	80	207	327	423	244	80	24	24	......
22	......	......	......	70	207	284	350	244	59	24	24	......
23	......	......	......	70	170	244	350	225	59	24	24	......
24	......	......	......	80	137	244	478	225	50	24	24	......
25	......	......	......	80	122	225	600	264	50	24	24	......
26	......	......	......	70	59	225	568	264	50	24	24	......
27	......	......	......	70	59	225	667	264	50	24	29	......
28	......	......	......	68	50	225	600	306	42	24	29	......
29	......	......	......	59	50	207	423	306	42	24	24	......
30	......	......	......	10	50	188	284	284	42	24	24	......
31	......	......	......	......	42	......	244	264	......	24	......	......
Total	......	......	......	1235	1785	5042	9105	8325	3622	1029	675	......
Mean	......	......	......	77.2	57.6	168	294	268	121	33.2	22.5	......
Max.	......	......	......	......	207	398	667	450	244	42	29	......
Min.	......	......	......	......	0	10	59	108	10	24	12	......
Acre-ft.	......	......	......	2450	3540	10000	18100	16500	7200	2040	1340	......

Discharge of South Fork South Platte at Lake George for 1918.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	136	29	83	108	76	154	51	50	......
2	......	......	......	83	29	95	83	69	122	47	50	......
3	......	......	......	60	29	83	83	71	175	47	50	......
4	......	......	......	42	29	108	108	113	203	53	50	......
5	......	......	......	36	29	136	199	160	154	53	40	......
6	......	......	36	29	29	166	183	169	122	51	42	......
7	......	......	36	29	25	217	235	184	122	45	46	......
8	......	......	42	29	25	256	256	189	76	45	42	......
9	......	......	42	36	25	302	507	182	69	50	29	......
10	......	......	36	36	20	380	1310	166	109	50	42	......
11	......	......	42	42	25	380	507	160	112	55	60	......
12	......	......	51	42	25	440	326	85	110	57	116	......
13	......	......	51	42	29	583	235	72	101	57	108	......
14	......	......	42	51	36	760	183	72	86	60	83	......
15	......	......	42	51	36	760	183	101	80	60	108	......
16	......	......	42	42	36	473	183	82	83	60	83	......
17	......	......	42	42	29	326	217	72	93	60	83	......
18	......	......	42	36	25	326	183	53	69	60	88	......
19	......	......	42	36	20	326	136	59	65	60	108	......
20	......	......	42	29	20	302	136	47	69	85	83	......
21	......	......	42	29	16	326	122	40	65	83	83	......
22	......	......	42	36	16	583	112	40	60	95	60	......
23	......	......	42	42	16	1210	112	47	60	85	60	......
24	......	......	42	42	20	1260	110	50	57	83	60	......
25	......	......	42	42	16	625	101	154	59	80	56	......
26	......	......	42	42	16	380	93	154	67	82	53	......
27	......	......	60	42	16	256	83	173	65	55	47	......
28	......	......	83	42	16	199	82	180	62	67	42	......
29	......	......	72	36	16	166	83	154	60	62	42	......
30	......	......	51	29	20	122	83	139	60	60	42	......
31	......	......	36	......	29	......	82	157	......	60	......	......
Total	......	......	1184	1311	747	11629	6424	3469	2789	1918	1908	......
Mean	......	......	45.5	43.7	24.1	388	207	112	93.0	61.9	63.6	......
Max.	......	......	83	136	36	1260	1310	189	203	95	116	......
Min.	......	......	36	29	16	83	82	40	57	45	29	......
Acre-ft.	......	......	2350	2600	1480	23100	12700	6890	5530	3810	3780	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of North Fork South Platte River at South Platte for 1917.
Drainage area, 450 Square Miles. Altitude, 6,097 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	65	136	552	620	260	102	69	69	23
2	......	......	......	30	124	552	575	230	120	69	65	18
3	......	......	......	65	136	575	575	230	106	69	65	22
4	......	......	......	35	136	575	485	202	92	69	65	24
5	......	......	......	65	148	645	508	230	92	69	65	24
6	......	......	......	78	120	575	485	230	92	69	65	22
7	......	......	......	58	148	575	485	174	102	69	59	22
8	......	......	......	76	161	575	530	174	98	65	54	20
9	......	......	......	88	148	620	530	174	102	36	54	20
10	......	......	......	98	161	820	645	174	92	47	47	20
11	......	......	......	88	161	948	530	174	86	54	42	22
12	......	......	......	78	174	895	440	188	82	65	47	......
13	......	......	......	98	202	920	420	202	82	69	50	......
14	......	......	......	88	230	975	400	188	86	69	47	......
15	......	......	......	94	342	1030	360	202	102	69	45	......
16	......	......	......	78	360	1060	360	188	92	65	45	......
17	......	......	......	82	485	1140	325	202	82	69	42	......
18	......	......	......	98	530	1140	308	188	82	65	36	......
19	......	......	......	98	508	1110	325	174	82	59	42	......
20	......	......	......	74	552	1110	342	174	82	63	45	......
21	......	......	......	102	530	1000	290	148	82	69	45	......
22	......	......	......	120	530	948	290	148	82	59	49	......
23	......	......	......	148	485	948	290	148	82	65	49	......
24	......	......	......	148	530	870	290	148	78	72	49	......
25	38	......	82	174	530	845	400	136	72	69	36	......
26	......	......	52	202	530	820	325	174	78	72	26	......
27	......	......	40	174	530	795	400	174	86	69	18	......
28	......	46	78	136	508	695	308	148	78	69	22	......
29	......	......	82	120	485	695	290	148	67	69	23	......
30	......	......	124	106	485	670	290	136	67	69	24	......
31	......	......	120	......	530	......	308	120	......	69	......	......
Total	......	......	578	2964	10635	24655	12729	5586	2628	2029	1390	237
Mean	......	......	82.6	98.8	343	822	411	180	87.6	65.5	46.3	21.5
Max	......	......	124	202	552	1140	645	260	120	72	69	24
Min	......	......	40	30	120	552	290	120	67	36	18	18
Acre-ft.	......	......	1150	5880	21100	48900	25300	11100	5210	4030	2760	469

Discharge of North Fork of South Platte at South Platte for 1918.
Drainage area, 450 Square Miles. Altitude, 6,097 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	90	202	462	508	257	113	109	102	......
2	......	......	......	100	202	440	485	257	124	102	96	......
3	......	......	......	84	202	485	462	272	196	102	102	......
4	......	......	......	80	230	508	440	242	182	102	96	......
5	......	......	......	76	260	485	440	227	156	92	96	......
6	......	......	......	61	275	462	440	224	182	92	113	......
7	......	......	......	90	325	508	440	284	169	92	113	......
8	......	......	......	71	325	552	440	254	156	92	92	......
9	......	......	......	96	308	645	485	224	156	92	72	......
10	......	......	......	122	325	670	462	224	156	92	102	......
11	......	......	......	102	290	745	620	222	141	92	92	......
12	......	......	58	113	260	770	620	222	131	92	76	......
13	......	......	61	124	260	820	598	236	117	92	76	......
14	......	......	24	148	275	920	575	236	109	92	92	......
15	......	......	28	161	290	795	620	208	113	92	88	......
16	......	......	24	161	380	720	670	191	148	82	92	......
17	......	......	26	148	380	720	530	177	156	82	66	......
18	......	......	40	136	420	670	440	164	136	92	76	......
19	......	......	43	148	420	670	440	151	124	124	82	......
20	......	......	43	124	462	820	440	158	117	113	102	......
21	......	......	47	113	420	895	440	148	113	92	63	......
22	......	......	35	148	462	1030	400	148	109	92	92	......
23	......	......	35	174	508	975	575	148	96	92	92	......
24	......	......	43	174	575	975	440	141	102	92	54	......
25	......	......	47	188	575	820	420	141	113	109	50	......
26	......	......	52	202	552	770	380	129	113	102	50	......
27	......	......	65	230	485	670	360	122	117	92	50	......
28	......	......	90	230	508	598	360	129	113	102	50	......
29	......	......	61	202	462	575	325	129	113	92	50	......
30	......	......	65	188	508	530	308	129	113	96	50	......
31	......	......	84	......	552	......	290	115	......	96	......	......
Total	......	......	971	4084	11698	20705	14453	5909	3984	2977	2427	......
Mean	......	......	48.6	136	377	690	466	191	133	96.0	80.9	......
Max	......	......	90	230	575	1030	670	284	196	144	113	......
Min	......	......	24	61	202	440	290	115	96	82	50	......
Acre-ft.	......	......	1930	8090	23200	41100	28700	11700	7910	5900	4810	......

Unless otherwise noted, all discharges are in cubic feet per second.

SOUTH PLATTE RIVER AT SOUTH PLATTE

Location.—In Sec. 25, T. 7 S., R. 70 W., in the Pike National Forest, three-fourths of a mile east of South Platte; about 300 feet below junction of the North and South forks; no tributary between the forks and the station, and none for several miles below.

Records Available.—March 28, 1902, to November 30, 1918.

Drainage Area.—2,610 square miles.

Gage.—An automatic recording gage.

Channel.—Shifting.

Discharge Measurements.—Made from car and cable during high water, and by wading at low stages.

Winter Flow.—Ice causes backwater during a portion of the winter months and measurements are made to determine the flow.

Regulation.—The flow is regulated to a certain extent by the Cheesman Reservoir, which is on the South Fork about 20 miles above the forks.

Diversions.—Lake Cheesman has a storage decree for 80,000 acre-feet and the Antero Reservoir for 46,000 acre-feet on the South Fork, South Platte, besides numerous decrees for meadow irrigation.

Accuracy.—Although the channel is shifting, sufficient discharge measurements have been obtained to enable fair estimates of discharge to be made.

Co-operation.—Station maintained in co-operation with the United States Geological Survey.

SOUTH PLATTE RIVER AT DENVER

Location.—Between the 15th Street and 16th Street bridges in Denver, about 500 feet below the mouth of Cherry Creek.

Records Available.—May 7, 1895, to December 31, 1918.

Drainage Area.—3,840 square miles.

Gage.—Automatic and chain gages. The chain gage was replaced by a slope gage November 9, 1916.

Channel.—Shifting.

Discharge Measurements.—Made from 15th Street or 19th Street bridges, or by wading.

Winter Flow.—The flow at this point is seldom affected by ice.

Diversions.—There are decrees for diversions of 1,922 second-feet from the South Platte between this station and South Platte and 5,988 second-feet from tributaries.

Discharge of South Platte River at South Platte for 1917.
Drainage Area, 2,610 Square Miles. Altitude, 6,097 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	200	210	1060	1150	875	600	180	66	......
2	......	......	......	150	210	1090	1090	775	568	164	68	......
3	......	......	......	169	225	1180	1010	650	546	151	66	......
4	......	......	......	121	225	1240	982	600	474	151	56	......
5	......	......	......	142	258	1210	928	650	377	151	60	......
6	......	......	......	142	225	1090	900	600	437	117	66	......
7	......	......	......	151	248	1040	850	750	449	106	90	......
8	......	......	......	108	258	1060	875	750	465	102	74	......
9	......	......	......	185	225	1120	982	675	470	114	74	......
10	......	......	......	204	240	1330	1300	750	457	134	77	......
11	......	......	......	166	258	1390	1600	850	457	335	87	......
12	......	......	......	175	292	1360	1420	850	425	983	90	......
13	......	......	......	175	328	1480	1210	850	417	357	90	......
14	......	......	......	180	385	1510	1040	850	425	117	84	......
15	......	......	......	180	700	1630	850	875	377	96	90	......
16	......	......	......	180	825	1660	800	875	338	92	82	......
17	......	......	......	190	875	1790	750	928	268	87	82	......
18	......	......	......	210	955	1860	775	955	244	87	64	......
19	......	......	......	165	955	1860	760	928	190	87	55	......
20	......	......	......	147	1040	1920	760	775	177	92	132	......
21	......	......	......	177	1120	1790	1140	700	204	87	132	......
22	......	......	......	204	1290	1790	1080	600	234	87	108	......
23	......	......	......	240	1240	1790	1060	650	234	79	106	......
24	......	......	......	258	1210	1660	900	650	190	79	106	......
25	120	......	......	258	1240	1660	1010	650	190	84	96	......
26	......	......	......	289	1190	1540	1300	625	185	87	85	......
27	......	......	......	268	1120	1480	1480	600	180	84	114	......
28	......	106	......	240	1100	1360	1540	650	185	87	90	......
29	......	......	......	210	1090	1300	1330	650	190	71	110	......
30	......	......	......	196	1040	1240	1180	675	195	71	128	......
31	......	......	......	......	1010	......	1060	650	......	64	......	......
Total	......	......	......	5680	21579	43490	33112	22911	10148	4583	2628	......
Mean	144	114	101	189	696	1450	1070	739	338	148	87.6	......
Max	......	......	......	289	1290	1920	1600	955	600	983	132	......
Min	......	......	......	108	210	1040	760	600	177	64	55	......
Acre-ft.	8850	6330	6210	11200	42800	86300	65800	45400	20100	9100	5210	......

Discharge of South Platte River at South Platte for 1918.
Drainage Area, 2,610 Square Miles. Altitude, 6,097 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	75	156	675	705	840	464	342	228	207	......
2	......	......	100	177	700	705	758	464	353	228	214	......
3	......	......	112	179	700	785	680	486	950	214	221	......
4	......	......	114	144	750	758	655	486	922	214	228	......
5	......	......	132	151	775	1040	868	556	812	200	243	......
6	......	......	121	132	800	1070	895	580	486	174	248	......
7	64	......	117	137	800	1100	868	705	442	162	253	......
8	......	......	132	130	800	1190	868	655	380	785	258	......
9	......	......	121	137	800	1220	895	630	400	705	258	......
10	......	......	100	169	775	1250	1190	630	421	187	228	......
11	......	......	110	169	775	1310	1680	605	307	150	200	......
12	......	......	100	196	750	895	1460	580	290	162	174	......
13	......	......	94	225	725	1010	1370	532	243	150	200	......
14	......	......	74	258	775	1550	1160	504	187	128	200	......
15	......	106	67	310	850	1610	1190	468	150	118	258	......
16	......	......	63	532	875	1610	1130	455	237	115	258	......
17	......	......	67	578	982	1490	1130	404	324	112	228	......
18	......	......	82	532	1010	1370	1100	368	310	108	174	......
19	......	......	90	510	955	1310	922	328	296	118	128	......
20	......	......	87	510	900	1490	840	290	282	200	128	......
21	......	......	88	488	850	1550	812	268	268	290	128	......
22	......	......	82	555	800	1870	812	249	255	258	108	......
23	......	......	71	578	800	2260	1010	258	242	174	131	......
24	......	......	74	600	840	2650	868	258	228	174	154	......
25	......	......	82	625	812	2000	812	307	238	200	177	......
26	......	......	84	675	785	1740	705	342	248	228	200	......
27	......	......	90	725	705	1490	680	346	258	274	174	......
28	......	......	132	725	705	1250	605	342	268	342	150	......
29	......	......	121	675	680	1100	580	368	279	324	150	......
30	......	......	114	675	680	950	556	392	290	200	150	......
31	......	......	151	......	730	......	486	380	......	200	......	......
Total	......	......	3047	11643	24559	40328	28425	13700	10708	7122	5828	......
Mean	......	......	98.3	388	792	1340	917	442	357	230	194	......
Max	......	......	151	725	1010	2650	1680	705	950	785	258	......
Min	......	......	63	130	675	705	486	249	150	108	108	......
Acre-ft.	......	......	6040	23100	48700	79700	56400	27200	21200	14100	11500	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of South Platte River at Denver for 1917.

Drainage Area, 3,840 Square Miles. Altitude, 5,240 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	144	96	111	193	236	2190	995	346	326	214	196	127
2	132	96	111	174	212	2190	950	287	306	196	178	95
3	144	120	111	144	212	2160	750	287	268	196	160	95
4	159	144	120	144	212	2080	552	306	250	196	160	111
5	159	132	144	132	260	2160	364	475	196	144	111	111
6	159	144	159	144	417	2120	236	579	160	111	144	95
7	159	144	132	159	497	2010	174	579	178	127	127	95
8	174	132	132	132	417	1880	212	500	196	127	127	95
9	174	120	132	120	444	1720	312	452	214	127	95	95
10	174	120	132	159	417	1770	579	452	214	111	95	80
11	174	120	132	174	497	1920	870	452	306	111	127	147
12	159	120	120	174	552	1880	1040	500	326	306	127	214
13	120	120	111	144	579	1820	780	524	306	475	95	160
14	111	132	111	144	552	1770	606	500	326	178	95	160
15	111	129	120	144	579	1770	382	579	346	144	111	196
16	102	126	120	144	750	1770	159	579	326	111	95	178
17	111	123	120	174	810	1720	390	690	326	95	127	160
18	120	120	120	132	870	1820	470	662	250	111	127	160
19	132	102	132	174	910	1820	417	662	232	95	127	160
20	132	102	144	174	1080	1820	497	690	214	144	111	178
21	132	102	132	174	1600	1770	750	470	196	127	127	178
22	120	102	132	174	2250	1600	750	409	214	144	144	160
23	111	96	132	193	2250	1380	750	409	196	144	144	144
24	111	96	132	212	2250	1330	662	409	214	144	111	144
25	120	120	159	212	2190	1720	634	388	196	127	127	137
26	132	120	132	236	2120	1600	780	367	268	160	95	137
27	132	132	132	260	2080	1540	840	409	232	160	95	136
28	144	120	120	260	2010	1380	840	388	214	160	95	136
29	144	......	144	236	1970	1180	840	409	214	178	111	135
30	144	......	144	260	1920	1130	634	409	232	178	95	135
31	132	......	212	......	2050	......	470	388	......	178	......	134
Total	4272	3330	4085	5296	33193	53020	18685	14556	7442	5019	3679	4288
Mean	138	119	132	176	1070	1770	603	470	248	162	123	138
Max	174	144	212	260	2250	2190	1040	690	346	475	196	214
Min	102	96	111	120	212	1130	159	287	160	95	95	95
Acre-ft.	8485	6610	8120	10500	65800	105000	37100	28900	14800	9960	7320	8480

Discharge of South Platte River at Denver for 1918.

Drainage Area, 3,840 Square Miles. Altitude, 5,240 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	115	54	124	149	576	459	440	239	108	273	239	228
2	130	92	140	179	536	341	390	285	98	221	253	221
3	124	115	152	210	434	305	390	415	313	228	258	228
4	109	146	143	203	458	465	415	395	753	210	261	228
5	121	159	136	210	531	591	495	513	975	206	265	228
6	124	146	133	196	571	746	675	772	753	210	285	235
7	86	146	130	182	576	753	615	682	451	196	293	250
8	103	156	133	156	520	792	627	663	372	206	305	250
9	130	146	152	143	458	831	688	579	289	851	250	243
10	50	146	156	156	515	836	905	462	313	405	228	199
11	50	143	106	162	547	831	1360	440	297	235	246	165
12	70	124	127	186	558	701	1440	430	243	182	246	158
13	109	124	112	200	443	350	1380	462	214	182	228	175
14	109	124	121	259	331	603	1220	720	182	128	221	192
15	103	97	115	318	290	1000	1140	759	254	143	235	199
16	115	86	100	259	251	1020	1070	405	337	137	210	210
17	106	115	100	348	331	989	1040	325	265	131	228	192
18	106	133	97	352	677	905	1040	333	325	165	158	158
19	130	112	83	331	582	805	954	250	345	185	192	143
20	124	65	75	302	405	870	753	210	317	182	192	175
21	106	80	83	290	453	1260	926	175	265	273	210	210
22	121	156	100	318	594	1360	947	192	250	285	185	192
23	130	121	83	356	594	1800	975	228	221	269	199	192
24	133	149	75	429	594	2820	975	228	203	265	210	100
25	130	124	46	520	632	2600	1200	210	199	313	228	100
26	136	106	52	553	664	1840	701	143	250	321	228	128
27	86	112	50	644	638	1480	633	119	265	321	228	158
28	94	80	103	698	606	1150	585	108	265	261	235	210
29	109	......	176	651	638	870	537	105	246	277	210	210
30	83	......	136	619	612	585	495	100	246	269	210	192
31	59	......	140	......	785	......	345	90	......	265	......	100
Total	3301	3357	3479	9579	16400	29988	25356	11037	9614	7795	6936	5869
Mean	106	120	112	319	529	1000	818	356	320	251	231	189
Max	136	159	176	698	785	2820	1440	772	975	851	305	250
Min	50	54	46	143	251	305	345	90	98	128	158	100
Acre-ft.	6520	6660	6890	19000	32500	59500	50300	21900	19000	15400	13700	11600

Unless otherwise noted, all discharges are in cubic feet per second.

SOUTH PLATTE RIVER NEAR KERSEY

Location.—At highway bridge in Sec. 9, T. 5 N., R. 64 W., 1¾ miles north of Kersey, 2 miles below the entrance of Lone Tree Creek, an intermittent stream, and 3 miles below the mouth of the Cache la Poudre River.

Records Available.—April 27, 1901, to October 31, 1903; March 1, 1905, to November 30, 1912; January 1, 1914, to December 31, 1918.

Drainage Area.—9,500 square miles.

Gage.—A chain gage, placed in the fall of 1906 in each of the two channels in which the river flows. These gages were referred to a datum slightly different from that of the original gage. During the past two years either one or the other of these gages has been stolen at various times, and a breakwater placed to protect the bridge has caused one channel to become practically dry during low and medium stages. Results have, therefore, been based largely on one gage.

Channel.—Shifting.

Discharge Measurements.—Made from bridge at high water and by wading at low water.

Winter Flow.—Ice causes slight backwater for a few days during the winter.

Diversions.—Between this station and Denver there are court decrees for diversions of 3,764 second-feet from the South Platte, and 17,000 second-feet from intervening tributaries, besides numerous flood water decrees.

Accuracy.—The channel is extremely shifting and results cannot be considered better than fair.

SOUTH PLATTE RIVER AT BALZAC

Location.—Six hundred feet above highway bridge in Sec. 13, T. 5 N., R. 55 W., at Balzac. No important tributaries between this station and Kersey.

Records Available.—January, 1917, to December 31, 1918.

Drainage Area.—17,700 square miles.

Gage.—Automatic recording gage installed April 26, 1918. New datum established at same time. Old gage on highway bridge.

Channel.—River in one channel, very shifting.

Discharge Measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter Flow.—Ice causes backwater during exceptionally cold weather only.

Accuracy.—Results are considered fair, when frequent discharge measurements are made. Discharge data for 1917 are based on the results of 23 measurements. Discharge data for 1918 are based on the results of 15 measurements.

Diversions.—There are court decrees for 2,148 second-feet on the South Platte River between this station and Kersey.

Discharge of South Platte River near Kersey for 1917.

Drainage Area, 9,500 Square Miles. Altitude, 4,612 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	760	564	600	564	544	8430	4880	318	155	556	850	587
2	760	544	600	564	587	8820	3750	275	165	519	871	587
3	760	544	576	544	600	8560	3130	190	165	519	782	537
4	760	564	554	535	587	8040	2990	165	165	527	787	537
5	714	587	564	526	614	7780	2850	145	165	527	695	504
6	677	587	576	526	661	7650	2700	145	145	602	656	587
7	644	587	564	526	737	7650	2560	165	145	610	612	504
8	614	592	564	518	1230	7000	2420	165	155	610	612	470
9	600	592	564	510	1310	6120	2270	190	165	610	612	504
10	614	592	576	518	1310	6120	2130	190	190	619	574	574
11	614	606	600	564	1090	6620	1990	190	165	662	612	612
12	614	620	629	564	1230	7000	1840	220	165	619	574	695
13	614	592	614	564	1740	6000	1390	220	165	628	612	945
14	564	620	661	544	1840	5500	1030	255	220	716	612	945
15	544	592	629	544	2240	4880	670	190	255	716	574	890
16	526	592	644	526	2900	4750	585	178	295	725	537	945
17	535	569	629	510	3750	5250	448	155	340	636	537	787
18	544	592	677	526	4500	5750	340	165	340	636	537	695
19	564	606	714	535	4500	6000	220	165	340	602	537	695
20	587	620	760	535	4620	5500	190	165	340	644	574	695
21	587	629	760	544	5380	4750	155	145	295	602	612	612
22	576	644	760	544	7000	4620	145	145	295	570	612	612
23	610	644	737	544	8040	4880	145	145	318	570	612	695
24	643	644	714	544	7910	5750	145	145	340	506	612	695
25	677	600	677	544	8040	5500	145	155	340	585	612	695
26	576	629	644	510	8560	5620	145	165	340	670	612	695
27	564	629	661	526	8560	5620	165	165	391	791	612	612
28	576	600	661	544	8560	5380	190	165	391	716	537	654
29	587	......	629	564	7910	5500	255	165	480	725	537	612
30	587	......	644	564	7520	5880	391	155	512	782	537	654
31	587	......	600	......	7910	....	366	165	......	840	......	612
Total	19179	16781	19782	16171	121980	186920	40630	5566	7942	19640	18652	20293
Mean....	619	599	638	539	3930	6230	1310	180	265	634	622	655
Max......	760	644	760	564	8560	8820	4880	318	512	840	850	945
Min......	526	544	554	510	544	4620	145	145	145	506	537	470
Acre-ft	38100	33300	39200	32100	242000	371000	80600	11100	15800	39000	37000	40300

Discharge of South Platte River near Kersey for 1918.

Drainage Area, 9,500 Square Miles. Altitude, 4,612 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	678	500	523	457	500	911	570	825	133	925	825	925
2	678	550	523	437	437	735	478	366	133	825	796	947
3	678	600	570	437	437	400	381	275	197	925	776	1002
4	623	650	570	437	310	282	381	174	220	875	727	1035
5	570	678	597	478	274	266	400	153	275	825	700	1035
6	570	650	623	523	252	252	381	174	636	825	845	947
7	570	706	623	570	247	252	363	366	1150	727	825	1002
8	547	735	570	570	242	266	363	475	875	727	845	1093
9	547	735	570	523	235	282	363	475	727	727	925	1002
10	623	678	523	478	235	282	457	333	636	727	875	895
11	650	650	478	478	266	320	1312	275	636	980	845	845
12	625	623	500	478	235	767	1312	220	552	825	796	825
13	597	623	478	457	330	1040	2017	174	475	825	776	776
14	623	623	478	500	291	1312	2485	133	475	681	727	776
15	570	623	478	570	237	2197	2485	220	437	681	727	796
16	570	597	457	735	227	3520	2810	636	636	636	700	845
17	570	623	437	678	229	3040	3760	475	681	681	681	845
18	570	623	437	623	227	2380	4000	400	727	727	663	845
19	547	570	437	570	227	2197	3280	333	727	727	681	776
20	570	500	418	523	229	1507	2700	333	727	825	756	796
21	547	623	400	547	227	2197	2380	275	727	825	727	875
22	570	735	418	570	227	4375	2590	197	727	776	709	875
23	547	678	418	523	227	6875	2590	174	727	727	756	875
24	570	623	400	523	227	7000	2485	133	636	727	825	825
25	523	597	400	523	229	7000	2925	133	636	825	825	727
26	523	523	400	523	230	7260	2197	133	681	925	845	727
27	523	523	418	570	235	6250	2017	133	875	845	895	681
28	523	523	418	570	235	3520	1752	133	925	845	980	681
20	500	......	437	570	282	1752	1507	133	925	796	947	727
30	437	......	523	523	678	911	995	133	925	825	925	825
31	450	......	523	......	735	......	803	133	......	825	......	980
Total	17689	17362	15045	15964	9199	69348	52539	8525	18839	24637	23925	26806
Mean....	571	620	485	532	297	2312	1695	275	628	795	798	865
Max......	678	735	623	735	735	7260	4000	825	1150	980	947	1093
Min......	437	500	400	437	227	227	363	133	133	636	663	681
Acre-ft	35100	34400	29800	31700	18300	138000	104000	16900	37400	48900	47500	53200

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of South Platte River at Balzac for 1917.
Drainage Area, 17,700 Square Miles. Altitude, 4,090 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	598	64	6400	770	220	220	510	460	126
2	......	......	......	545	124	6900	855	193	220	560	438	126
3	......	......	......	545	80	7300	560	180	220	510	438	126
4	65	......	......	505	54	7000	610	193	220	460	415	126
5	......	......	......	124	74	6600	415	180	220	350	392	126
6	......	747	......	103	74	6300	254	193	254	330	237	145
7	......	......	......	46	69	6800	180	220	254	460	180	145
8	......	......	......	41	59	6300	110	193	254	510	180	136
9	......	......	225	37	59	5800	110	168	392	535	168	126
10	......	......	200	59	87	5300	110	157	415	350	168	126
11	......	......	103	50	87	4940	110	145	330	273	145	126
12	......	436	87	69	59	4940	110	168	292	273	110	220
13	28	......	69	46	50	5200	254	145	254	273	136	254
14	......	......	59	41	64	4690	438	157	220	254	145	292
15	......	......	50	41	80	4200	610	157	254	254	126	330
16	......	......	50	37	135	3290	273	157	254	254	126	330
17	......	......	155	37	225	3080	311	145	254	330	145	237
18	......	......	59	33	650	2670	254	145	254	370	156	311
19	......	......	69	33	1400	3290	237	145	254	370	136	415
20	......	......	37	37	2000	1000	220	145	370	370	126	370
21	......	......	37	41	2700	1500	220	145	392	311	126	350
22	......	616	37	41	3400	1500	126	145	415	254	126	237
23	32	......	46	41	5300	1000	126	145	370	237	110	145
24	......	......	50	41	6100	1000	145	145	330	193	110	145
25	......	......	59	47	6000	1000	168	145	330	168	110	103
26	......	......	80	47	6450	1000	168	126	392	254	118	96
27	......	34	87	47	6800	1110	168	118	415	415	110	96
28	......	......	112	41	6800	1230	168	145	415	440	118	96
29	......	......	124	37	6800	1000	168	145	415	460	126	96
30	......	......	650	47	6400	950	180	126	460	485	126	96
31	......	......	598	......	6000	......	220	180	......	510	......	273
Total	......	......	3043	3457	68224	113290	8648	4971	9339	11323	5379	5926
Mean....	......	......	132	115	2200	3780	279	160	311	365	179	191
Max......	......	......	......	598	......	......	855	220	460	560	460	415
Min.......	......	......	......	37	50	950	110	118	220	168	110	96
Acre-ft.	......	......	6030	6840	135000	225000	17200	9840	18500	22400	10700	11700

Discharge of South Platte River at Balzac for 1918.
Drainage Area, 17,700 Square Miles. Altitude, 4,090 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	205	377	423	32	121	156	123	128	59	107	55	257
2	166	423	288	34	101	215	195	169	61	95	59	153
3	147	450	288	36	86	254	189	209	68	88	64	88
4	147	450	610	40	90	221	200	156	50	88	66	68
5	128	450	660	46	95	143	200	177	64	76	59	55
6	166	450	470	65	118	128	192	271	70	82	52	55
7	166	450	377	65	126	128	183	414	90	90	61	47
8	128	450	332	65	101	158	254	377	119	86	68	50
9	128	450	288	65	95	197	278	382	143	82	76	50
10	92	450	205	65	90	200	240	339	128	80	84	44
11	128	450	205	92	101	195	234	335	107	74	94	40
12	423	450	65	128	101	153	268	296	80	72	90	40
13	288	470	46	110	114	136	458	289	66	95	86	40
14	205	332	42	128	114	143	628	267	59	90	82	40
15	246	332	38	46	117	257	1294	343	76	74	78	47
16	377	470	38	44	121	395	1690	304	84	70	74	47
17	400	205	38	42	112	608	1434	296	66	76	74	40
18	377	205	38	40	88	900	1364	355	59	76	74	35
19	446	200	38	38	101	1056	1322	373	76	82	74	40
20	423	200	36	36	114	984	912	274	86	92	64	40
21	332	260	36	34	146	798	710	228	64	88	59	......
22	354	332	36	32	200	520	395	192	82	76	64	......
23	354	470	36	30	215	840	209	161	86	72	64	......
24	400	332	34	28	203	2405	143	183	80	76	114	......
25	518	246	34	26	183	2825	221	183	84	86	164	......
26	377	310	34	28	180	2910	493	161	107	86	214	......
27	332	356	34	34	197	2825	488	119	88	59	264	......
28	423	377	32	46	136	2570	209	114	82	57	314	......
29	332	......	32	76	117	1145	86	126	103	57	364	......
30	377	......	32	82	143	311	101	107	90	56	373	......
31	423	......	32	......	143	......	97	59	......	56	......	......
Total	9008	10397	4897	1633	3969	23776	14810	7387	2477	2444	3428	......
Mean....	291	371	158	54.4	128	793	478	238	82.6	79.0	114	......
Max......	518	470	660	128	215	2825	1690	414	143	107	373	......
Min.......	92	200	32	26	86	128	86	59	50	56	52	......
Acre-ft	17900	20600	9720	3240	7870	47200	29400	14600	4920	4860	6780	......

Unless otherwise noted, all discharges are in cubic feet per second.

SOUTH PLATTE RIVER NEAR JULESBURG

Location.—At highway bridge one mile south of Julesburg, about Sec. 33, T. 12 N., R. 44 W. No important tributaries between this station and the Colorado-Nebraska state line a few miles below. All the tributaries for 100 miles or more above the station are intermittent, except Lodge Pole Creek, which has a small but nearly constant flow.

Records Available.—April 2, 1902, to November 16, 1906; May 12, 1908, to November 30, 1912; April 8, 1914, to December 31, 1918.

Drainage Area.—20,600 square miles.

Gage.—When the station was re-established in 1908 a gage was placed in each of the two main channels; both gages read practically the same as the original gage on the lower bridge 2,000 feet below the present site. On May 5, 1915, six scales with open pulleys were placed on the bridge. The zeros of these scales were arranged so as to be at the same datum. These scales are numbered one to six, beginning at the south end of the bridge. Gages numbered one, two and three are over one channel.

Channel.—Shifting.

Discharge Measurements.—Made from bridge at high water and wading at low water stages.

Winter Flow.—Ice causes backwater during the winter months.

Diversions.—Between Kersey and Julesburg there are court decrees for diversions of 5,316 second-feet from the South Platte, and diversions of 1,240 second-feet from intervening tributaries, including Lodge Pole Creek in Wyoming and Nebraska and Crow Creek in Wyoming, besides numerous flood decrees. Between the state line and mouth, diversions of 260 second-feet from the South Platte have been granted in Nebraska.

Accuracy.—Sufficient measurements have been made so that results can be considered good.

Co-operation.—During 1915 this station was maintained in co-operation with the State Engineer of Nebraska. During 1916 the station was maintained by the State Engineer of Colorado. The salary of the gage reader is paid by the Great Western Sugar Company.

Note.—Results for 1915 are based on gage readings taken on scales numbered one, two and three. In 1916, 1917 and 1918 each main channel has been computed separately and the totals for the entire stream published.

Discharge of South Platte River at Julesburg for 1917.
Drainage Area, 20,600 Square Miles. Altitude, 3,469 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	310	296	600	561	179	9100	1800	37	30	395	671	241
2	310	350	610	698	262	8870	1640	37	30	420	686	267
3	310	400	610	753	292	8420	1560	32	30	490	719	259
4	310	450	620	814	256	7770	1640	32	30	484	737	235
5	310	500	630	794	226	8200	1720	32	30	483	736	271
6	310	550	640	859	211	8420	1500	40	30	494	595	225
7	309	600	650	734	173	7980	1220	40	30	480	653	235
8	310	657	660	641	165	7350	1270	38	30	494	595	158
9	310	680	670	591	152	6940	813	38	30	501	612	155
10	310	700	680	541	144	6940	654	38	30	600	506	158
11	300	720	620	502	144	6300	595	38	34	651	436	280
12	300	750	550	453	130	5440	312	38	34	635	438	400
13	300	770	490	384	123	4760	200	34	30	545	378	530
14	300	790	420	342	145	4930	138	39	38	553	347	530
15	300	810	360	320	108	5100	115	34	34	515	356	620
16	300	836	290	292	83	4760	101	30	34	477	379	650
17	290	830	288	256	69	3520	91	30	38	447	400	690
18	290	820	452	247	60	2950	87	30	38	485	204	730
19	290	800	712	308	65	2330	85	30	38	569	158	730
20	290	790	739	338	52	2150	77	38	38	546	143	800
21	290	676	631	328	52	2150	68	38	38	625	143	640
22	290	750	613	311	601	2330	65	38	34	577	190	710
23	290	725	511	252	1880	2240	54	30	34	580	186	820
24	290	700	483	212	2730	1970	58	30	34	610	197	770
25	290	675	392	204	4040	1640	50	30	63	525	201	750
26	286	650	290	243	5100	1640	44	24	134	549	201	640
27	290	620	283	243	6540	1640	42	30	212	580	229	540
28	290	589	318	268	7350	1970	40	34	278	616	229	540
29	290	......	373	256	7770	1970	38	30	380	651	229	500
30	290	......	358	214	7770	1880	45	30	402	615	243	500
31	290	......	421	......	8200	......	34	30	......	594	......	500
Total	9245	18484	15964	12959	55072	141660	16156	1049	2265	16786	11797	15074
Mean....	298	660	515	432	1780	4720	521	33.8	75.5	541	393	486
Max......	......	......	......	859	8200	9100	1800	40	402	651	737	......
Min.......	......	......	......	204	52	1640	34	24	30	395	143	......
Acre-ft	18300	36700	31700	25700	109000	281000	32000	2080	4490	33300	23400	29900

Discharge of South Platte River at Julesburg for 1918.
Drainage Area, 20,600 Square Miles. Altitude, 3,469 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	68	307	24.0	843	217	79	416	474	744
2	......	......	......	78	292	22.0	522	166	77	462	416	769
3	......	......	......	74	271	21.0	249	125	80	474	406	849
4	......	......	......	61	232	23.0	117	88	80	466	416	909
5	......	......	......	74	238	35.0	101	71	80	455	429	767
6	......	......	......	55	228	30.0	77	106	80	478	429	891
7	......	......	......	55	207	22.0	58	87	80	472	453	594
8	......	......	649	55	179	25.0	60	188	80	467	495	566
9	......	......	......	55	155	28.0	58	157	99	461	495	561
10	......	......	......	55	148	21.0	40	144	198	593	495	586
11	......	......	......	53	129	19.0	19	121	178	531	495	499
12	......	......	......	53	120	20.0	19	153	279	502	461	465
13	......	......	......	53	116	17.0	28	228	323	495	479	410
14	......	......	......	55	80	20.0	16	435	314	497	489	400
15	......	......	......	92	80	14.0	16	467	243	474	495	437
16	......	......	......	135	56	16.5	75	502	242	474	495	395
17	......	......	314	117	56	15.5	180	569	261	477	459	421
18	......	......	322	147	53	16.5	492	645	235	451	453	421
19	......	......	316	152	49	15.5	743	592	209	464	450	386
20	......	......	270	138	47	16.5	737	613	226	453	467	458
21	......	......	292	161	40	14.5	728	593	191	481	474	499
22	......	......	243	166	46	16.5	689	515	199	487	403	426
23	......	......	243	166	43	15.5	555	469	175	452	471	371
24	......	......	237	207	37	16.5	411	374	178	450	391	362
25	......	......	193	259	44	15.5	1114	305	275	469	209	429
26	......	......	179	292	43	15.5	839	266	339	495	243	350
27	......	......	131	353	50	257.0	514	221	327	531	337	388
28	......	......	111	366	27	912.0	454	180	327	544	411	379
29	......	......	110	353	28	1122.0	454	114	423	532	506	380
30	557	......	89	333	35	1081.0	409	86	437	474	580	380
31	......	......	94	......	35	......	333	71	......	453	......	380
Total	......	......	3793	4281	3471	3887	10950	8868	6314	14930	13276	15672
Mean....	......	......	......	143	112	130	353	286	210	482	443	506
Max......	......	......	......	366	307	1122	1114	645	437	593	580	909
Min.......	......	......	......	53	27	14	16	71	77	416	209	350
Acre-ft.	......	......	......	8510	6890	7740	21700	17600	12500	29600	26400	31100

Unless otherwise noted, all discharges are in cubic feet per second.

TARRYALL CREEK NEAR JEFFERSON

Location.—At Robbins' ranch, in Sec. 6, T. 9 S., R. 74 W., about 10 miles southeast of Jefferson. Rock Creek enters half a mile below.

Records Available.—June 27, 1914, to October 27, 1917; station was then discontinued.

Drainage Area.—223 square miles.

Gage.—Vertical staff.

Channel.—Slightly shifting.

Discharge Measurements.—Made by wading and from footbridge 400 feet down stream.

Winter Flow.—Ice causes backwater during the winter months and the records are discontinued.

Diversions.—There are court decrees for diversions of 314 second-feet from Tarryall Creek above the station and for 926 second-feet from tributaries entering above. The Boreas Ditch diverts a small amount of water from the Blue River to Tarryall Creek.

Accuracy.—Results fair.

Co-operation.—Records furnished by the United States Geological Survey.

Discharge of Tarryall Creek at Jefferson for 1917.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	30	137	181	105	28	5.0	......	......
2	......	......	......	......	39	105	159	105	22	3.0	......	......
3	......	......	......	......	51	32	137	111	35	1.0	......	......
4	......	......	......	......	53	12	137	111	25	2.2	......	......
5	......	......	......	......	39	10	126	148	20	3.8	......	......
6	......	......	......	......	32	7	137	126	18	5.0	......	......
7	......	......	......	......	34	13	137	137	39	5.0	......	......
8	......	......	......	......	34	10	400	137	95	5.0	......	......
9	......	......	......	......	25	10	1320	115	35	5.4	......	......
10	......	......	......	......	85	12	480	115	32	6.2	......	......
11	......	......	......	......	216	28	238	111	28	3.0	......	......
12	......	......	......	......	159	45	170	91	18	2.7	......	......
13	......	......	......	......	148	85	137	111	18	3.8	......	......
14	......	......	......	......	69	137	89	111	25	3.0	......	......
15	......	......	......	......	34	216	73	126	13	3.0	......	......
16	......	......	......	126	39	250	95	148	22	3.0	......	......
17	......	......	......	105	34	250	109	216	13	2.7	......	......
18	......	......	......	99	28	250	181	238	13	3.0	......	......
19	......	......	......	101	31	250	238	216	13	2.7	......	......
20	......	......	......	53	113	273	170	181	13	2.7	......	......
21	......	......	......	73	216	296	148	65	12	3.0	......	......
22	......	......	......	85	59	238	148	111	10	6.2	......	......
23	......	......	......	87	53	204	99	119	8	8.2	......	......
24	......	......	......	77	35	204	159	99	7	10.0	......	......
25	......	......	......	79	22	181	216	32	10	12.0	......	......
26	......	......	......	81	12	204	411	51	8	15.0	......	......
27	......	......	......	53	10	204	273	45	8	20.0	......	......
28	......	......	......	37	12	181	115	59	10	......	......	......
29	......	......	......	23	18	159	126	51	10	......	......	......
30	......	......	......	41	12	159	137	45	10	......	......	......
31	......	......	......	......	20	......	148	39	......	......	......	......
Total	......	......	......	1120	1762	4162	6694	3475	618	145.6	......	......
Mean	......	......	......	74.7	56.8	139	216	112	20.6	5.39	......	......
Max	......	......	......	126	216	296	1320	238	95	20	......	......
Min	......	......	......	23	10	7	73	32	7	1	......	......
Acre-ft.	......	......	......	2220	3490	8270	13300	6890	1230	289	......	......

Station discontinued.
Unless otherwise noted, all discharges are in cubic feet per second.

GENEVA CREEK AT GRANT

Location.—In the Pike National Forest, at highway bridge in Sec. 9, T. 7 S., R. 74 W., at Grant postoffice; 300 feet above mouth of creek.

Records Available.—November 3, 1911, to March 31, 1918.

Drainage Area.—74 square miles.

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge Measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter Flow.—Ice causes backwater during the winter months. Discharge estimated from measurements.

Diversions.—There is a court decree for a diversion above this station for 1.0 second-foot from Geneva Creek and a provisional decree for 480 acre-feet.

Accuracy.—Results are considered good.

Co-operation.—Station maintained in co-operation with the United States Geological Survey.

CLEAR CREEK NEAR GOLDEN

Location.—About 2 miles above Golden, in Sec. 6, T. 4 S., R. 70 W., and a short distance below the headgate of the Golden ditch. The only tributary of importance between the station and the mouth is Ralston Creek, which enters about 12 miles below.

Records Available.—December 4, 1918, to December 31, 1909; June 8 to September 24, 1911; January 26, 1912, to November 16, 1918.

Drainage Area.—Approximately 380 square miles.

Gage.—Automatic recording gage, whose datum has remained unchanged.

Channel.—Slightly shifting.

Discharge Measurements.—Made from car and cable located near the gage.

Winter Flow.—Ice causes backwater during the winter months, but discharge measurements are made to determine the approximate winter flow.

Diversions.—Between Forks Creek and the station near Golden there is a court decree for a diversion of 26 second-feet by the Golden ditch.

Accuracy.—Conditions are favorable for accurate results, and the records should be reliable.

Co-operation.—Records were furnished by the United States Geological Survey.

Discharge of Geneva Creek at Grant for 1917.
Drainage Area, 74 Square Miles. Altitude, 8,566 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	18	11	10	12	17	76	301	121	37	24	22	12
2	18	10	10	11	19	86	266	104	33	24	19	13
3	18	10	10	11	16	89	252	106	32	23	13	13
4	18	11	10	14	14	116	219	97	33	23	12	12
5	18	11	10	17	13	118	222	95	34	23	12	12
6	18	11	10	10	16	106	191	87	32	23	13	12
7	18	11	11	14	22	106	209	78	33	23	12	9
8	18	11	12	11	23	132	262	72	31	22	20	10
9	18	11	12	12	19	167	280	70	30	22	18	12
10	18	11	12	14	20	283	301	72	30	22	18	13
11	18	11	12	13	23	280	252	68	30	22	22	13
12	17	11	12	12	23	298	219	70	30	22	22	13
13	15	11	12	14	34	266	200	68	30	22	13	13
14	13	11	12	14	56	400	185	68	30	21	21	13
15	13	10	12	13	76	495	206	68	30	20	18	13
16	15	12	12	13	95	472	159	72	30	19	21	13
17	16	11	28	12	116	487	153	68	28	20	22	13
18	16	11	24	15	132	468	156	61	28	14	21	13
19	16	12	16	13	109	464	173	62	27	15	21	13
20	15	11	15	14	66	442	156	61	27	18	18	13
21	13	11	12	15	82	423	148	56	27	20	17	13
22	12	10	12	27	70	400	159	53	26	21	17	13
23	12	10	10	23	72	381	156	55	25	16	15	13
24	12	10	13	35	82	415	182	48	25	19	13	13
25	12	10	10	25	76	396	182	46	25	18	13	13
26	12	10	10	27	72	345	173	44	25	18	13	13
27	11	10	10	24	82	345	170	46	25	14	13	12
28	11	10	11	17	78	330	153	46	25	18	12	15
29	11	......	12	19	74	312	148	45	25	32	12	12
30	11	......	12	19	74	298	145	45	24	42	10	13
31	11	......	14	......	73	......	137	40	......	26	......	12
Total	462	300	388	490	1744	8996	6115	2092	867	666	493	389
Mean....	14.9	10.7	12.5	16.3	56.3	300	197	67.5	28.9	21.5	16.4	12.5
Max......	18	12	28	35	132	495	301	121	37	42	22	15
Min.......	11	10	10	10	13	76	137	40	24	14	10	9
Acre-ft.	916	594	769	970	3460	17900	12100	4150	1720	1320	976	769

Discharge of Geneva Creek at Grant for 1918.
Drainage Area 74 Square Miles. Altitude 8,566 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	12	10	12	......	......	......	......	......	......	......	......	......
2	12	10	12	......	......	......	......	......	......	......	......	......
3	12	10	12	......	......	......	......	......	......	......	......	......
4	12	12	11	......	......	......	......	......	......	......	......	......
5	12	12	12	......	......	......	......	......	......	......	......	......
6	13	11	10	......	......	......	......	......	......	......	......	......
7	13	12	11	......	......	......	......	......	......	......	......	......
8	13	13	12	......	......	......	......	......	......	......	......	......
9	13	13	12	......	......	......	......	......	......	......	......	......
10	10	12	12	......	......	......	......	......	......	......	......	......
11	8	11	11	......	......	......	......	......	......	......	......	......
12	10	10	11	......	......	......	......	......	......	......	......	......
13	12	11	11	......	......	......	......	......	......	......	......	......
14	12	10	12	......	......	......	......	......	......	......	......	......
15	12	10	12	......	......	......	......	......	......	......	......	......
16	12	10	13	......	......	......	......	......	......	......	......	......
17	12	10	12	......	......	......	......	......	......	......	......	......
18	12	10	12	......	......	......	......	......	......	......	......	......
19	12	10	11	......	......	......	......	......	......	......	......	......
20	12	10	11	......	......	......	......	......	......	......	......	......
21	12	10	11	......	......	......	......	......	......	......	......	......
22	12	10	12	......	......	......	......	......	......	......	......	......
23	12	10	11	......	......	......	......	......	......	......	......	......
24	12	11	12	......	......	......	......	......	......	......	......	......
25	12	12	12	......	......	......	......	......	......	......	......	......
26	12	12	16	......	......	......	......	......	......	......	......	......
27	11	13	14	......	......	......	......	......	......	......	......	......
28	11	13	13	......	......	......	......	......	......	......	......	......
29	11	......	13	......	......	......	......	......	......	......	......	......
30	11	......	16	......	......	......	......	......	......	......	......	......
31	11	......	13	......	......	......	......	......	......	......	......	......
Total	363	308	375	......	......	......	......	......	......	......	......	......
Mean....	11.7	11.0	12.1	......	......	......	......	......	......	......	......	......
Max......	13	13	16	......	......	......	......	......	......	......	......	......
Min.......	8	10	10	......	......	......	......	......	......	......	......	......
Acre-ft.	719	611	744	......	......	......	......	......	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Clear Creek near Golden for 1917.
Drainage Area, 380 Square Miles. Altitude 5,620 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	45	45	45	75	115	426	1180	442	144	82	......	......
2	45	45	35	60	116	442	1090	406	132	86	......	......
3	45	45	35	52	115	474	1000	376	120	83	......	......
4	45	45	40	40	107	538	971	362	120	80	......	......
5	45	45	45	50	122	574	944	341	118	79	......	......
6	45	55	40	61	111	551	938	334	104	76	......	......
7	55	55	35	64	118	528	883	327	104	73	......	......
8	60	60	45	71	118	569	938	299	106	72	......	......
9	55	60	55	76	107	636	910	282	102	72	......	......
10	60	60	60	82	128	810	976	282	109	73	......	......
11	65	55	45	79	140	938	932	236	102	75	......	......
12	50	55	40	76	152	910	861	243	96	78	......	......
13	45	50	40	88	175	993	820	254	99	72	......	......
14	45	45	50	78	232	1040	780	274	102	71	......	......
15	45	45	60	67	316	1130	735	254	100	72	......	......
16	45	50	45	86	387	1270	690	257	97	75	......	......
17	45	50	50	88	457	1330	650	250	92	75	......	......
18	50	50	50	97	528	1450	636	278	92	75	......	......
19	50	50	55	86	502	1450	646	268	96	76	......	......
20	50	45	55	54	520	1300	720	243	91	75	......	......
21	45	50	60	59	492	1440	623	212	86	74	......	......
22	40	60	60	76	470	1350	574	197	91	72	......	......
23	40	60	45	107	442	1440	596	209	83	72	......	......
24	40	60	40	124	450	1440	665	212	78	72	......	......
25	45	55	40	124	470	1440	685	206	83	75	......	......
26	45	50	35	138	438	1370	685	218	78	75	......	......
27	50	55	40	144	426	1340	636	209	80	75	......	......
28	50	50	75	113	430	1280	546	229	82	75	......	......
29	50	......	106	115	410	1300	515	200	82	75	......	......
30	60	......	106	115	410	1240	510	172	83	75	......	......
31	50	......	85	......	434	......	492	150	......	75	......	......
Total	1505	1450	1617	2545	9438	30999	23827	8222	2952	2335	......	......
Mean	48.5	51.8	52.2	84.8	304	1030	769	265	98.4	75.3	......	......
Max	......	......	......	144	528	1450	1180	442	144	86	......	......
Min	......	......	......	40	107	426	492	150	78	71	......	......
Acre-ft.	2980	2980	3210	5050	18700	61300	47300	16300	5860	4630	......	......

Discharge of Clear Creek near Golden for 1918.
Drainage Area, 380 Square Miles. Altitude, 5,620 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	104	638	1100	341	......	113	112	......
2	......	......	......	......	132	610	1040	341	......	104	111	......
3	......	......	......	......	160	605	980	306	......	106	109	......
4	......	44	......	......	188	708	862	341	......	111	107	......
5	......	......	......	......	216	703	758	341	......	111	104	......
6	......	......	......	......	244	758	758	324	......	115	101	......
7	......	......	......	......	271	862	764	341	......	116	98	......
8	......	......	......	......	259	1040	770	306	......	111	95	......
9	......	......	......	......	247	1160	776	271	......	111	94	......
10	......	......	......	......	236	1340	782	236	......	122	94	......
11	77	18	......	......	274	1610	788	236	......	130	94	......
12	......	......	......	......	274	1730	794	236	......	120	94	......
13	......	......	......	......	278	1790	801	236	......	107	94	......
14	......	......	......	......	278	2090	808	236	......	102	94	......
15	......	......	......	......	316	1790	808	236	......	102	94	......
16	......	......	......	......	430	1730	808	203	......	104	94	......
17	......	......	......	......	480	1670	808	203	......	107	......	......
18	......	......	......	......	530	1670	758	......	......	109	......	......
19	......	......	......	......	535	1550	645	......	......	111	......	......
20	......	......	......	......	535	1670	595	......	......	118	......	......
21	......	......	......	113	550	1610	550	......	120	116	......	......
22	......	......	......	110	585	1670	550	......	118	116	......	......
23	......	......	......	102	630	1730	550	......	118	116	......	......
24	......	......	......	102	736	1670	550	......	118	116	......	......
25	......	......	......	104	736	1550	502	......	124	118	......	......
26	......	......	......	107	730	1460	466	......	132	118	......	......
27	......	......	......	110	730	1340	414	......	140	117	......	......
28	......	......	......	113	780	1220	414	......	140	116	......	......
29	......	......	......	110	670	1160	376	......	128	115	......	......
30	......	......	......	107	665	1100	376	......	120	114	......	......
31	......	......	......	......	665	......	341	......	......	113	......	......
Total	......	......	......	1078	13464	40234	21292	4734	1258	3505	1589	......
Mean	......	50.0	60.0	108	434	1340	687	278	126	113	99.3	......
Max	......	......	......	113	780	2090	1100	341	140	130	112	......
Min	......	......	......	102	104	605	341	203	118	102	94	......
Acre-ft.	......	......	......	2140	26700	79700	42200	9370	2500	6950	3150	......

Unless otherwise noted, all discharges are in cubic feet per second.

SOUTH BOULDER CREEK NEAR ROLLINSVILLE

Location.—At highway bridge in Sec. 35, T. 1 S., R. 73 W., 1 mile west of Rollinsville, in the Pike National Forest. The nearest important tributary, Jennie Creek, enters 4 miles above.

Records Available.—September 10, 1910, to April 30, 1918.

Drainage Area.—39 square miles.

Gage.—Vertical staff.

Channel.—Fairly permanent.

Discharge Measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter Flow.—Ice causes backwater during the winter months. Flow estimated from measurements.

Diversions.—There are no court decrees for diversions above the station, and therefore it is probable that the records represent the natural run-off.

Accuracy.—Conditions are favorable for fairly accurate results and the estimates of discharge should be reliable.

Co-operation.—Records furnished by the United States Geological Survey.

SOUTH BOULDER CREEK AT ELDORADO SPRINGS

Location.—At the mouth of the canyon at Eldorado Springs, in Sec. 30, T. 1 S., R. 70 W., 3 miles southwest of Marshall. No important tributaries within several miles.

Records Available.—May 15, 1895, to September 30, 1901; July 1, 1904, to December 31, 1918.

Drainage Area.—125 square miles.

Gage.—Vertical staff; datum unchanged.

Channel.—Fairly permanent.

Discharge Measurements.—Made by wading.

Winter Flow.—Warm springs keeping channel open during the winter.

Diversions.—There are court decrees for diversions of 137 second-feet above the station and 1,658 second-feet below. There are also a number of flood-water decrees.

Discharge of South Boulder Creek near Rollinsville for 1917.
Drainage Area, 39 Square Miles. Altitude, 8,500 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	31	105	300	90	22	6.2	16	15
2	......	......	......	......	31	102	260	72	22	6.2	15	......
3	......	......	......	......	28	109	240	63	22	6.2	15	......
4	......	......	......	......	22	170	240	63	17	6.2	15	......
5	......	......	......	......	23	170	222	44	13	6.2	14	......
6	......	......	......	......	25	166	222	44	13	6.2	14	......
7	......	......	......	......	23	170	205	41	13	6.2	14	......
8	......	......	......	......	23	170	205	36	13	6.2	14	......
9	......	......	......	......	23	300	222	32	14	6.2	14	......
10	......	......	......	......	23	320	222	31	14	4.8	17	......
11	......	......	......	......	32	300	222	34	14	4.8	19	......
12	......	......	......	......	41	320	188	32	14	6.2	14	......
13	......	......	......	......	51	320	156	32	14	6.9	14	......
14	......	......	......	......	122	320	156	32	14	6.9	14	11
15	......	......	......	16	170	360	135	36	14	5.5	14	......
16	......	......	......	17	222	360	122	36	14	5.5	13	......
17	......	......	......	17	260	400	115	41	14	5.5	9	......
18	......	......	......	23	280	360	115	32	13	6.2	8	......
19	......	......	......	17	222	340	115	31	13	6.9	6	......
20	......	......	......	20	188	360	115	31	13	7.6	9	......
21	......	7.5	......	23	138	360	122	31	10	8.3	14	......
22	......	......	......	32	115	400	115	28	10	8.3	8	......
23	......	......	......	34	115	400	103	27	10	8.3	9	......
24	......	......	......	41	115	380	118	27	10	8.3	12	......
25	......	......	......	34	118	340	115	22	10	9.3	9	......
26	......	......	......	37	115	320	212	22	13	10.0	8	......
27	......	......	......	32	102	300	205	22	10	11.0	13	......
28	......	......	......	31	102	300	115	22	10	12.0	9	......
29	......	......	......	31	105	300	128	23	8	13.0	9	......
30	......	......	......	31	105	300	118	23	6	14.0	15	......
31	......	......	......	......	105	......	102	22	......	15.0	......	......
Total	......	......	......	436	3075	8622	5229	1122	397	240.1	374	......
Mean	......	......	......	27.2	99.2	287	169	36.2	13.2	7.75	12.5	......
Max	......	......	......	41	280	400	300	90	22	15	19	......
Min	......	......	......	16	22	102	102	22	6	4.8	6	......
Acre-ft.	......	......	......	863	6100	17100	10400	2230	786	477	744	......

Discharge of South Boulder Creek Near Rollinsville for 1918.
Drainage Area, 39 Square Miles. Altitude, 8,500 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	22	......	......	......	......	......	......	......	......
2	......	......	......	23	......	......	......	......	......	......	......	......
3	......	......	......	22	......	......	......	......	......	......	......	......
4	......	......	......	26	......	......	......	......	......	......	......	......
5	......	......	......	23	......	......	......	......	......	......	......	......
6	......	......	......	24	......	......	......	......	......	......	......	......
7	......	......	......	24	......	......	......	......	......	......	......	......
8	......	......	......	23	......	......	......	......	......	......	......	......
9	......	......	9	24	......	......	......	......	......	......	......	......
10	......	......	9	26	......	......	......	......	......	......	......	......
11	......	......	10	30	......	......	......	......	......	......	......	......
12	......	......	13	35	......	......	......	......	......	......	......	......
13	......	......	12	41	......	......	......	......	......	......	......	......
14	......	......	11	39	......	......	......	......	......	......	......	......
15	......	......	11	33	......	......	......	......	......	......	......	......
16	......	......	9	32	......	......	......	......	......	......	......	......
17	......	......	9	33	......	......	......	......	......	......	......	......
18	......	......	13	33	......	......	......	......	......	......	......	......
19	......	......	14	32	......	......	......	......	......	......	......	......
20	......	......	11	24	......	......	......	......	......	......	......	......
21	......	......	8	23	......	......	......	......	......	......	......	......
22	......	......	16	24	......	......	......	......	......	......	......	......
23	......	......	16	29	......	......	......	......	......	......	......	......
24	......	......	16	31	......	......	......	......	......	......	......	......
25	......	......	16	33	......	......	......	......	......	......	......	......
26	......	......	28	36	......	......	......	......	......	......	......	......
27	......	......	27	41	......	......	......	......	......	......	......	......
28	......	......	32	32	......	......	......	......	......	......	......	......
29	......	......	21	36	......	......	......	......	......	......	......	......
30	......	......	23	37	......	......	......	......	......	......	......	......
31	......	......	21	......	......	......	......	......	......	......	......	......
Total	......	......	355	891	......	......	......	......	......	......	......	......
Mean	......	......	15.4	29.7	......	......	......	......	......	......	......	......
Max.	......	......	32	41	......	......	......	......	......	......	......	......
Min.	......	......	8	22	......	......	......	......	......	......	......	......
Acre-ft.	......	......	702	1770	......	......	......	......	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of South Boulder Creek at Eldorado Springs for 1917.
Drainage Area, 125 Square Miles. Altitude, 5,800 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	19	37	79	265	268	115	24	14	24	14
2	......	......	19	42	91	265	230	99	24	14	28	......
3	......	......	19	25	91	265	200	74	20	14	20	......
4	......	......	19	28	91	300	187	74	20	12	20	......
5	......	......	19	24	81	300	187	74	20	12	20	......
6	......	......	19	22	94	265	187	67	20	14	17	......
7	......	......	19	23	117	230	174	60	20	14	35	......
8	......	......	19	22	113	265	200	54	20	17	19	......
9	......	......	19	48	106	300	200	48	20	14	19	......
10	......	......	19	54	128	415	187	48	20	14	19	......
11	......	......	19	48	160	430	174	48	20	14	15	......
12	......	......	19	50	184	394	150	48	20	14	15	..
13	......	......	19	73	206	435	170	48	20	11	14	......
14	......	......	19	73	206	355	148	48	20	11	14	......
15	......	......	19	58	288	425	138	53	20	11	19	......
16	......	......	19	63	271	450	108	53	17	14	16	......
17	......	......	19	63	288	480	99	48	17	14	14	......
18	......	......	19	83	288	488	99	43	17	14	3	......
19	......	......	20	73	323	464	90	33	17	8	8	......
20	......	......	20	60	285	464	108	38	17	14	14	......
21	......	......	22	64	285	380	108	38	14	14	20	......
22	......	......	22	74	290	380	90	38	14	14	20	......
23	......	......	24	95	290	400	95	38	14	17	14	......
24	......	......	24	94	290	350	95	28	14	10	14	......
25	......	......	24	103	273	370	95	28	14	10	8	......
26	......	......	14	97	268	315	155	28	14	10	14	......
27	......	......	14	97	268	332	180	28	14	12	14	......
28	......	......	28	92	248	278	138	38	14	20	8	......
29	......	......	28	74	230	295	108	28	14	8	17	......
30	......	......	42	71	230	278	153	28	14	20	14	......
31	......	......	42	......	265	......	124	24	......	28	......	......
Total	......	......	646	1830	6427	10633	4645	1517	533	427	491	......
Mean	......	......	20.8	61.0	207	354	150	48.9	17.8	13.8	16.4	......
Max.	......	......	42	103	323	488	268	115	24	28	30	......
Min.	......	......	14	22	79	230	90	24	14	8	3	......
Acre-ft.	......	......	1280	3630	12700	21100	9220	3010	1060	849	976	......

Discharge of South Boulder Creek at Eldorado Springs for 1918.
Drainage Area, 125 Square Miles. Altitude, 5,800 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	14	47	93	286	326	65	28	37	37	14
2	......	......	14	51	107	245	325	74	28	43	43	14
3	......	......	4	41	114	245	225	65	33	49	37	14
4	......	......	11	42	148	259	225	65	37	49	37	14
5	......	......	21	44	197	259	200	65	47	43	37	10
6	......	......	21	34	223	300	187	74	47	43	37	24
7	......	......	24	43	211	333	175	74	38	43	37	24
8	......	......	28	39	169	379	175	57	35	37	28	14
9	......	......	28	46	328	410	175	49	35	37	28	14
10	......	......	21	56	320	454	200	49	38	49	37	14
11	......	......	28	52	249	479	200	49	35	49	40	14
12	......	......	28	60	192	524	175	43	35	43	29	14
13	......	......	32	80	182	514	175	49	31	37	29	14
14	......	......	32	91	182	544	162	49	31	37	29	14
15	......	......	14	88	195	529	162	65	33	37	29	14
16	......	......	11	84	239	484	175	49	49	37	29	14
17	......	......	23	77	267	455	150	49	57	37	29	14
18	......	......	20	68	291	429	150	43	37	37	33	14
19	......	......	24	58	291	414	126	37	37	43	37	14
20	......	......	22	58	291	419	126	37	37	43	33	14
21	......	......	24	62	291	448	138	33	33	37	33	14
22	......	......	27	63	305	702	126	33	33	37	23	14
23	......	......	22	63	305	615	115	33	33	37	23	14
24	......	......	32	74	349	598	103	28	33	37	20	14
25	......	......	43	68	334	544	103	28	37	37	21	14
26	......	......	49	84	349	470	103	28	49	43	19	14
27	......	......	48	88	329	414	83	28	49	37	19	14
28	......	......	63	86	329	375	83	28	37	37	16	14
29	......	......	57	82	315	338	83	28	43	37	14	14
30	......	......	47	84	300	303	83	28	43	37	14	14
31	......	......	44	......	315	......	74	28	......	37	......	14
Total	......	......	876	1913	7810	12738	4908	1430	1138	1243	877	450
Mean	......	......	28.3	63.8	252	425	158	46.1	37.9	40.1	29.2	14.5
Max.	......	......	63	91	349	702	326	74	57	49	43	24
Min.	......	......	4	34	93	245	74	28	28	37	14	10
Acre-ft.	......	......	1740	3800	15500	25300	9720	2830	2260	2470	1740	892

Unless otherwise noted, all discharges are in cubic feet per second.

BOULDER CREEK NEAR ORODELL

Location.—One mile above Orodell station, Sec. 34, T. 1 N., R. 71 W.

Records Available.—May 12, 1917, to December 21, 1918. From May 14, 1895, to December 20, 1909, a station was maintained four miles below present station. From March 8, 1907, to November 26, 1914; February 27 to December 12, 1916, a station was maintained one mile below present station.

Drainage Area.—108 square miles.

Gage.—Automatic recording gage installed by the Colorado Power Company.

Channel.—Shifting in extremely high water.

Discharge Measurements.—Made from car and cable.

Winter Flow.—Ice causes backwater during winter months and during this period discharge measurements are made to determine time flow.

Diversions.—There are no diversions from Boulder Creek above the station for irrigation, but there are court decrees for 165 second-feet from tributaries entering above. Below the station there are decrees for diversions of 2,871 second-feet from Boulder Creek.

Artificial Control.—The Colorado Power Company's plant one mile above the station withholds the water for a portion of the day and thus causes a considerable variation of gage height during low water.

Co-operation.—Station maintained in co-operation with the Colorado Power Company.

ST. VRAIN CREEK AT LYONS

Location.—Three-fourths of a mile below Lyons, in Sec. 17, T. 3 N., R. 70 W., one-fourth mile below the junction of North and South St. Vrain Creeks and just below Stone Canyon.

Records Available.—August 1, 1887, to October 31, 1890; June 13, 1895, to October 31, 1903; July 1, 1904, to December 31, 1918.

Drainage Area.—209 square miles.

Gage.—Inclined staff gage installed August 9, 1909, at practically the same datum as the inclined staff gage used from 1895 to 1903. It is not known whether the gage used prior to 1895 was located at the present site.

Channel.—Permanent.

Discharge Measurements.—Made from car and cable.

Winter Flow.—Ice causes very little backwater at this station.

Diversions.—There are court decrees for the diversion of 166 second-feet from the St. Vrain and tributaries above the station. Below there are court decrees for 1,632 second-feet from St. Vrain Creek and floodwater diversions of 190,000 acre-feet.

Co-operation.—Station maintained in co-operation with the Great Western Sugar Co.

Discharge of Boulder Creek Near Orodell for 1917.

Drainage Area, 108 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	130	461	267	35	26	32	51
2	......	......	......	......	......	140	416	227	32	29	32	26
3	......	......	......	......	......	152	393	178	26	29	32	46
4	......	......	......	......	......	164	372	120	40	24	32	36
5	......	......	......	......	......	164	393	112	51	24	32	57
6	......	......	......	......	......	130	372	112	57	24	32	57
7	......	......	......	......	......	130	350	112	51	24	29	57
8	......	......	......	......	......	140	372	103	46	26	29	57
9	......	......	......	......	......	152	393	103	40	29	29	36
10	......	......	......	......	......	164	393	69	40	26	24	51
11	......	......	......	......	......	192	393	103	57	29	19	51
12	......	......	......	......	103	164	372	103	40	29	26	46
13	......	......	......	......	96	178	350	103	36	29	24	46
14	......	......	......	......	120	178	350	96	36	21	21	46
15	......	......	......	......	152	192	308	96	36	26	26	44
16	......	......	......	......	140	192	288	96	36	29	26	42
17	......	......	......	......	164	192	247	96	40	29	32	41
18	......	......	......	......	164	210	178	88	40	26	17	39
19	......	......	......	......	164	227	192	82	36	24	36	38
20	......	......	......	......	164	416	178	82	32	40	36	36
21	......	......	......	......	178	461	178	82	29	21	40	35
22	......	......	......	......	164	484	192	63	24	26	40	33
23	......	......	......	......	164	507	178	63	17	32	36	32
24	......	......	......	......	164	484	192	57	24	32	40	51
25	......	......	......	......	152	530	227	63	26	29	29	32
26	......	......	......	......	152	484	247	51	29	36	40	46
27	......	......	......	......	120	507	247	63	32	32	46	57
28	......	......	......	......	112	484	247	63	32	26	36	63
29	......	......	......	......	112	484	192	51	29	26	36	50
30	......	......	......	......	103	461	267	40	51	29	46	36
31	......	......	......	......	130	......	288	37	......	36	......	46
Total	......	......	......	......	2818	8493	9226	2981	1100	868	955	1384
Mean....	......	......	......	......	141	283	298	96.2	36.7	28.0	31.8	44.6
Max.	......	......	......	......	......	530	461	267	57	40	46	63
Min.......	......	......	......	......	......	130	178	37	17	21	17	26
Acre-ft.	......	......	......	......	5590	16800	18300	5920	2180	1720	1890	2740

Discharge of Boulder Creek Near Orodell for 1918.

Drainage Area, 108 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	46	43	45	34	68	247	372	130	59	48	56	42
2	51	42	41	51	68	259	342	128	63	55	67	53
3	57	41	38	45	71	267	325	106	88	53	40	69
4	51	40	49	40	73	243	350	120	76	63	45	57
5	51	40	61	35	75	255	372	186	84	42	48	69
6	52	44	62	30	79	292	367	189	78	41	51	75
7	53	46	46	25	91	316	316	175	62	49	51	69
8	54	51	46	42	97	372	333	150	55	53	51	48
9	56	57	36	40	97	329	359	145	70	62	57	63
10	61	32	24	46	92	372	363	126	59	67	37	57
11	54	51	39	38	91	393	368	111	61	57	34	67
12	46	32	46	46	59	406	354	97	44	59	56	63
13	39	40	32	51	68	452	389	105	42	27	63	63
14	46	42	34	45	65	507	456	134	40	50	57	63
15	69	49	41	40	70	452	416	117	38	55	57	46
16	40	61	42	40	75	530	416	118	59	59	69	69
17	51	40	43	40	100	580	389	113	58	68	44	65
18	48	49	37	40	106	590	288	108	52	64	49	57
19	46	46	39	47	147	555	288	108	51	62	53	57
20	44	53	39	40	130	590	267	102	43	38	63	65
21	42	44	36	40	136	772	308	88	50	87	57	69
22	40	40	36	57	132	779	316	92	35	64	61	55
23	40	48	29	63	138	746	288	88	55	67	69	64
24	40	40	24	63	239	752	275	75	59	64	40	52
25	39	51	36	69	300	708	247	67	53	76	69	47
26	42	40	40	75	337	620	202	84	62	69	69	65
27	46	53	40	75	342	575	181	94	50	69	82	59
28	49	49	51	74	359	521	216	75	46	51	63	43
29	46	......	46	72	342	443	231	58	31	51	57	67
30	45	......	46	70	333	416	189	67	50	51	69	65
31	44	......	24	......	308	......	136	61	......	58	......	58
Total	1488	1264	1248	1473	4688	14339	9719	3417	1673	1779	1684	1871
Mean....	48.0	45.1	40.3	49.1	151	478	314	110	55.8	57.4	56.1	60.4
Max.	69	61	62	75	359	779	456	189	88	87	82	69
Min.......	39	32	24	25	59	243	136	58	31	27	34	42
Acre-ft.	2950	2500	2480	2920	9290	28400	19300	6760	3320	3530	3340	3710

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of St. Vrain Creek at Lyons for 1917.
Drainage Area, 209 Square Miles. Altitude, 5,349 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	9	6	11	45	144	490	855	254	89	23	29	16
2	9	6	9	18	238	465	725	238	81	23	19	16
3	9	6	9	25	254	415	580	208	73	21	19	13
4	9	6	11	11	254	415	515	193	81	19	19	10
5	9	9	13	15	290	415	515	193	89	19	16	6
6	9	9	8	18	350	370	580	167	89	19	16	8
7	9	11	9	13	350	330	580	180	106	19	16	8
8	11	11	8	18	330	350	515	167	89	19	15	10
9	13	9	8	52	330	415	580	167	73	19	13	8
10	13	11	6	58	350	580	580	156	73	22	13	10
11	13	11	9	58	415	615	688	156	60	23	15	16
12	13	11	9	81	515	515	650	144	68	23	18	19
13	9	9	9	124	515	490	515	144	89	23	16	19
14	11	11	11	115	515	515	580	144	89	19	19	21
15	9	9	11	106	580	580	465	124	81	19	19	19
16	6	9	9	106	650	768	440	124	89	19	19	18
17	8	9	11	89	650	900	415	124	81	18	16	16
18	9	9	11	124	615	990	392	124	73	19	13	18
19	11	11	18	124	580	945	392	124	68	15	12	19
20	11	9	18	106	650	900	415	124	60	23	14	18
21	11	9	25	115	688	900	415	144	60	19	16	16
22	7	13	25	134	810	945	392	144	48	21	19	16
23	8	11	18	167	650	1090	370	115	48	19	19	13
24	6	11	18	167	615	945	370	106	37	23	18	13
25	6	34	13	167	580	990	370	106	37	19	16	13
26	6	9	15	167	515	990	330	98	42	19	16	13
27	9	11	25	167	515	990	330	89	37	19	16	14
28	11	11	25	144	490	900	310	167	29	23	13	14
29	9	......	45	124	440	900	310	144	23	9	16	16
30	11	......	58	144	415	990	370	134	29	18	19	18
31	8	......	58	......	440	......	370	124	......	29	......	16
Total	292	291	533	2802	14633	21103	14914	4626	1991	622	504	450
Mean	9.42	10.4	17.2	93.4	472	703	481	149	66.4	20.1	16.8	14.5
Max.	13	34	58	167	810	1090	855	254	106	29	29	21
Min.	6	6	6	11	144	330	310	89	23	9	13	6
Acre-ft.	579	578	1060	5560	29000	41800	29600	9160	3950	1240	1000	892

Discharge of St. Vrain River at Lyons for 1918.
Drainage Area, 209 Square Miles. Altitude, 5,349 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	13	11	18	30	65	347	347	172	100	65	38	17
2	15	12	15	30	59	249	370	185	59	59	34	18
3	15	12	13	23	85	285	370	160	65	65	32	21
4	15	12	15	23	100	285	444	172	100	59	32	23
5	12	13	15	23	100	370	470	249	109	148	30	16
6	12	12	15	18	109	370	444	215	72	137	32	15
7	8	8	15	20	118	418	418	249	118	118	34	13
8	11	8	15	23	118	525	470	185	100	100	21	11
9	10	10	15	26	118	557	418	160	100	100	23	10
10	8	12	18	34	118	856	418	137	92	100	41	10
11	6	15	18	34	109	942	418	118	85	118	29	8
12	6	15	18	38	92	900	370	137	72	118	30	11
13	8	15	18	48	100	1255	418	137	65	100	41	11
14	15	11	18	59	85	1255	590	160	85	65	22	9
15	15	10	13	78	85	1147	370	118	92	85	23	13
16	15	6	12	59	118	942	590	118	127	85	23	15
17	12	6	15	48	127	900	525	109	118	85	16	15
18	12	6	15	38	127	942	394	370	100	92	22	13
19	12	6	15	43	127	812	185	137	92	85	30	12
20	15	6	15	38	172	995	418	118	85	78	30	15
21	13	6	18	43	172	1367	325	100	78	72	13	13
22	12	12	15	48	172	1485	305	100	65	65	14	13
23	12	15	15	48	215	1367	267	92	65	59	12	13
24	12	12	18	48	267	1147	249	85	72	38	11	12
25	12	12	18	59	267	995	232	92	85	38	12	13
26	12	13	20	59	267	771	215	100	100	30	15	13
27	12	13	30	72	285	658	200	118	85	32	13	13
28	12	15	26	59	305	497	185	118	78	34	16	13
29	15	......	20	59	285	497	172	118	72	40	16	13
30	12	......	18	59	325	370	160	109	72	40	15	13
31	10	......	23	......	325	......	149	109	......	36	......	13
Total	369	304	532	1287	5017	23506	10906	4547	2608	2346	720	418
Mean	11.9	10.9	17.2	42.9	162	784	352	147	86.9	75.7	24.0	16.7
Max.	15	15	30	78	325	1485	590	249	127	148	41	23
Min.	6	6	12	18	59	249	149	85	59	30	11	8
Acre-ft.	732	605	1060	2550	9960	46600	21600	9040	5170	4650	1430	1030

Unless otherwise noted, all discharges are in cubic feet per second.

BIG THOMPSON RIVER NEAR DRAKE

Location.—In Sec. 2, T. 5 N., R. 71 W., at highway bridge No. 7 in Big Thompson Canyon, 200 yards below Loveland dam and 1½ miles east of Drake, in Larimer County. Nearest tributary, North Fork, enters at Drake.

Drainage Area.—274 square miles (measured on topographic maps).

Records Available.—September 18, 1917, to September 30, 1918.

Gage.—Bristol pressure gage attached to left bridge abutment.

Discharge Measurements.—Made from single span bridge.

Channel and Control.—Channel is pool in which several feet of silt are deposited and scoured out; control 50 feet downstream at rapids of compact gravel; practically permanent. Banks not subject to overflow.

Ice.—Stage-discharge relation seriously affected by ice. Winter measurements made at section one-half mile upstream.

Extremes of Discharge.—Data too few.

Diversions.—Court decrees for diversions of 23 second-feet from river above station and 2277 second-feet below, also decrees for storage of 81,000 acre-feet below station.

Regulation.—Alternate melting and freezing of mountain snow during spring causes diurnal fluctuation of discharge. No artificial regulation.

Co-operation.—Field data furnished by City of Loveland. Check measurements made by United States Geological Survey.

Accuracy.—Stage-discharge relation permanent; affected by ice during December. Rating curve well-defined. Operation of recording gage fairly satisfactory until June 5, after which date chain gage readings only available. Daily discharge ascertained by applying to rating table mean daily gage heights obtained by inspection of gage height graph. Results good.

CACHE LA POUDRE RIVER AT MOUTH OF CANON, NEAR FORT COLLINS

Location.—In Sec. 15, T. 8 N., R. 70 W., 3 miles below the intake of the Fort Collins waterworks, 12 miles above Fort Collins; half a mile above mouth of Lewstone Creek.

Records Available.—March 15, 1884, to October 15, 1901; February 3, 1910, to November 30, 1918.

Drainage Area.—1,060 square miles.

Gage.—An automatic recording gage installed November 30, 1909. No information available concerning the gage used 1884 to 1901.

Channel.—Permanent.

Discharge Measurements.—Made from car and cable.

Winter Flow.—Ice causes backwater during the winter months.

Regulation.—The flow is regulated by the Chambers Lake and Halligan Reservoirs and by ditches diverting water from the headwaters of the Laramie and Grand Rivers and Michigan Creek across the divide.

Diversions.—There are court decrees for the diversion of 614 second-feet above this station.

Discharge of Big Thompson River Near Drake for 1917.
Drainage Area, 305 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	......	......	......	......	61	44	34
2	......	......	......	......	......	......	......	......	......	61	42	30
3	......	......	......	......	......	......	......	......	......	57	42	31
4	......	......	......	......	......	......	......	......	......	54	40	23
5	......	......	......	......	......	......	......	......	......	52	38	24
6	......	......	......	......	......	......	......	......	......	52	38	24
7	......	......	......	......	......	......	......	......	......	46	40	23
8	......	......	......	......	......	......	......	......	......	52	40	24
9	......	......	22	......	......	......	......	......	......	49	36	24
10	......	......	......	......	......	......	......	......	......	46	34	25
11	......	......	......	......	......	......	......	......	......	44	30	26
12	......	......	......	......	......	......	......	......	......	46	31	27
13	......	......	......	......	......	......	......	......	......	44	30	28
14	......	......	......	......	......	......	......	......	......	42	32	29
15	......	......	......	......	......	......	......	......	......	42	36	30
16	......	......	......	......	......	......	......	......	......	38	35	31
17	......	......	......	......	......	......	......	......	......	38	30	32
18	......	......	......	......	......	......	......	230	106	35	24	33
19	......	......	......	......	......	......	......	......	98	30	29	33
20	......	24	......	......	......	......	......	......	93	29	34	33
21	......	......	......	89	......	......	......	......	89	28	38	33
22	......	......	......	......	......	......	......	......	85	27	34	33
23	......	......	26	......	......	......	......	......	80	26	32	32
24	......	......	......	......	......	......	629	......	80	25	31	30
25	......	......	......	......	......	......	......	......	89	24	30	30
26	......	26	......	......	......	......	......	......	80	24	31	30
27	......	......	......	......	......	......	......	......	76	30	31	29
28	......	......	......	......	......	......	......	......	72	35	24	28
29	......	......	......	......	......	......	......	......	61	40	30	32
30	......	......	......	......	......	......	......	178	61	49	34	30
31	......	......	......	......	......	......	......	......	......	49	......	26
Total	......	......	......	......	......	......	......	......	1070	1275	1020	897
Mean	......	......	......	......	......	......	......	......	82.3	41.1	34.0	28.9
Max.	......	......	......	......	......	......	......	......	106	61	44	34
Min.	......	......	......	......	......	......	......	......	61	24	24	23
Acre-ft.	......	......	......	......	......	......	......	......	2120	2530	2020	1780

Discharge of Big Thompson River Near Drake for 1918.
Drainage Area, 305 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	28	......	36	27	102	460	......	......	......	......	......	......
2	27	......	......	27	109	432	392	......	......	......	......	......
3	26	......	......	27	131	470	......	......	......	......	......	......
4	......	......	......	26	167	543	......	......	......	......	......	......
5	......	19	......	26	179	630	......	......	......	......	......	......
6	......	......	......	26	194	......	......	201	......	......	......	......
7	......	......	......	25	230	870	......	......	......	......	......	......
8	16	......	......	26	242	1190	......	......	......	......	......	......
9	......	......	......	26	225	......	279	......	......	......	......	......
10	......	......	......	30	232	......	......	......	......	......	......	......
11	......	......	......	34	201	......	......	......	......	......	......	......
12	......	......	......	42	183	1310	......	......	......	......	......	......
13	......	......	......	51	171	......	......	......	......	......	......	......
14	......	......	......	66	179	......	......	96	......	......	......	......
15	......	......	......	73	194	......	291	......	......	......	......	......
16	......	......	......	59	252	......	......	......	......	......	......	......
17	......	......	......	51	282	......	......	......	......	......	......	......
18	......	......	......	42	306	......	......	......	......	......	......	......
19	......	20	......	48	291	1310	......	......	......	......	......	......
20	......	......	25	57	312	1310	......	......	......	......	......	......
21	......	......	23	64	402	......	......	54	......	......	......	......
22	18	......	22	66	470	......	309	......	......	......	......	......
23	......	......	23	66	480	......	......	......	......	......	......	......
24	......	......	26	73	480	870	......	......	......	......	......	......
25	......	......	31	77	485	......	......	......	......	......	......	......
26	......	......	30	84	495	485	......	......	......	......	......	......
27	......	......	37	96	506	......	......	......	......	......	......	......
28	......	......	28	97	516	......	......	......	......	......	......	......
29	......	......	28	98	527	......	......	......	......	......	......	......
30	......	......	27	99	537	......	322	......	......	......	......	......
31	......	......	27	......	548	......	......	......	......	......	......	......
Total	......	......	......	1609	9628	......	......	......	......	......	......	......
Mean	18.0	19.0	28.0	53.6	311	......	......	......	......	......	......	......
Max.	......	......	......	99	548	......	......	......	......	......	......	......
Min.	......	......	......	25	102	......	......	......	......	......	......	......
Acre-ft.	1110	1060	1720	3190	19100	......	......	......	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Cache la Poudre at Canon, Mouth of Canon, for 1917.
Drainage Area, 1,060 Square Miles. Altitude, 5,070 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	55	180	2340	4300	810	285	125	125	50
2	......	......	......	35	300	2200	3840	635	310	125	125	50
3	......	......	......	26	350	2060	3660	598	310	125	125	45
4	......	......	......	24	375	2200	3480	560	395	110	125	45
5	......	......	......	32	430	2270	2870	560	395	110	110	45
6	......	......	......	62	300	2130	2870	525	425	110	85	40
7	......	......	......	55	325	2060	2410	490	490	110	75	40
8	......	......	......	55	300	2200	2710	425	490	125	85	40
9	......	......	......	70	278	2710	2480	425	425	110	65	40
10	......	......	......	90	255	3840	2410	395	395	110	65	40
11	......	......	......	90	490	5000	2560	365	395	110	65	45
12	......	......	......	90	695	4600	2480	365	395	98	65	55
13	......	......	......	115	695	4210	2340	425	395	98	65	60
14	......	......	......	115	730	4020	2200	395	365	110	58	60
15	......	......	......	130	1240	4120	2060	338	365	110	65	60
16	......	......	......	115	1790	4210	1860	338	395	98	65	65
17	......	......	......	115	1990	4400	1660	365	395	98	65	70
18	......	......	......	115	2060	5000	1420	338	260	98	58	75
19	......	......	......	130	1990	4800	1300	338	195	85	50	85
20	......	......	......	115	2130	5000	1480	365	175	98	75	100
21	......	......	......	145	2410	5200	1360	285	175	110	75	100
22	......	......	......	215	2060	5300	1300	260	175	110	65	100
23	......	......	......	278	1860	5800	1240	238	158	110	58	110
24	......	......	......	300	1790	5200	1420	260	158	98	65	100
25	......	......	......	300	1990	5400	1300	260	158	98	75	90
26	......	......	......	325	2560	4800	1190	238	140	110	75	100
27	......	......	......	350	2340	5000	1190	238	140	110	65	105
28	......	......	70	180	2060	4400	1090	365	140	125	50	109
29	......	......	70	145	1920	4500	1090	365	140	140	45	110
30	......	......	90	145	1920	4900	990	310	140	125	50	100
31	......	......	90	......	2340	......	900	285	......	140	......	100
Total	......	......	......	4017	40148	119865	63443	12159	8779	3439	2239	2234
Mean	......	......	......	134	1290	4000	2050	392	292	111	74.6	72.1
Max.	......	......	......	350	2560	5800	4300	810	490	140	125	110
Min.	......	......	......	24	180	2060	900	238	140	85	45	40
Acre-ft.	......	......	......	7970	79300	238000	126000	24100	17400	6820	4440	4430

Discharge of Cache la Poudre River at Mouth of Canon for 1918.
Drainage Area, 1,060 Square Miles. Altitude 5,070 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	70	202	1410	1200	325	300	85	85	......
2	......	......	......	74	220	1300	1200	325	300	83	85	......
3	......	......	......	72	220	1460	1100	350	325	85	90	......
4	......	......	......	70	248	1690	1200	350	350	88	90	......
5	......	......	......	69	285	1810	1150	375	350	92	85	......
6	......	......	......	64	360	1940	1050	375	350	147	98	......
7	......	......	......	70	470	2260	1050	400	325	125	75	......
8	......	......	......	75	470	2400	1050	325	275	103	58	......
9	......	......	......	68	470	2620	1000	300	210	93	58	......
10	......	......	......	69	440	2840	2400	260	186	90	75	......
11	......	......	......	77	410	3150	2060	250	140	95	85	......
12	......	......	......	81	385	3150	1520	260	128	95	69	......
13	......	......	......	105	285	3150	1300	275	113	90	65	......
14	......	......	......	144	240	3230	1100	270	110	90	69	......
15	......	39	......	202	360	3480	1100	275	131	88	69	......
16	......	......	......	185	565	3740	1050	250	150	81	65	......
17	......	......	......	168	710	3650	1150	230	150	80	58	......
18	......	......	......	168	790	3310	1000	210	140	80	53	......
19	......	......	......	168	870	2840	870	250	125	80	75	......
20	......	......	......	164	870	3650	710	210	113	80	75	......
21	......	......	......	168	910	3650	670	192	110	80	59	......
22	......	......	......	178	910	2920	670	192	102	80	58	......
23	......	......	......	154	1000	2690	600	192	81	79	58	......
24	......	......	......	150	1150	2760	635	210	77	79	62	......
25	......	......	......	150	1360	2400	565	230	85	79	65	......
26	......	......	......	164	1520	2200	495	275	100	77	62	......
27	......	......	64	185	1460	1870	430	275	105	75	58	......
28	......	......	68	185	1630	1690	375	250	107	81	60	......
29	......	......	69	185	1870	1460	375	275	105	81	60	......
30	......	......	62	202	1870	1300	375	275	103	79	60	......
31	......	......	64	......	1690	......	325	300	......	85	......	......
Total	......	......	327	3884	24240	76020	29775	8531	5246	2725	2084	......
Mean	......	......	65.4	129	782	2530	960	275	175	88	69.5	......
Max.	......	......	......	202	1870	3740	2400	400	350	147	98	......
Min.	......	......	......	64	202	1300	325	192	77	75	53	......
Acre-ft.	......	......	649	7680	48100	151000	59000	16900	10413	5410	4140	......

Unless otherwise noted, all discharges are in cubic feet per second.

CACHE LA POUDRE RIVER AT MOUTH

Location.—About three miles below Greeley and one-half mile above mouth.

Records Available.—March 24, 1903, to October 31, 1903; July 20, 1904, to November 30, 1904; February 1, 1914, to December 8, 1918.

Gage.—The vertical staff gage used since 1914 was replaced April 4, 1916, by a slope gage on the right bank directly opposite the old gage, but reading 2.50 feet lower. A Bristol automatic gage was also installed on this date.

Discharge Measurements.—By wading at low stages and from highway bridge about one mile above at high stages.

Diversions.—Below all diversions on this stream.

Accuracy.—Low water measurements are good, but high water measurements are subject to error on account of poor conditions at the highway bridge.

Co-operation.—During 1916 station was maintained in co-operation with the Colorado Experiment Station.

NORTH PLATTE RIVER NEAR NORTH GATE

Location.—In Sec. 11, T. 11 N., R. 80 W., at highway bridge on Interstate Highway, 6 miles south of Colorado-Wyoming line and 6 miles northwest of North Gate, in Jackson County. Three small tributaries, Camp, Three-Mile, and Six-Mile Creeks, enter North Platte between station and state line. These have very little flow except spring run-off.

Drainage Area.—1,440 square miles.

Records Available.—May 23, 1915, to September 30, 1918.

Gage.—Vertical staff located at downstream side of center pier. Recording gage installed April 8, 1918.

Discharge Measurements.—Made from two-span bridge during high water, and by wading at low stages.

Channel and Control.—Channel composed of sand, gravel, and small boulders; control located 200 feet downstream at small rapids which shift slightly. Banks not liable to overflow.

Ice.—Discharge relation seriously affected by ice; observations discontinued during winter months.

Diversions.—There are court decrees for diversions of 3,060 second-feet from the North Platte and tributaries in Colorado.

Regulation.—None.

Accuracy.—Results excellent.

Co-operation.—Station maintained by the United States Geological Survey, from which records were obtained.

Discharge of Cache la Poudre at Mouth for 1917.

..Drainage Area, ... Square Miles. Altitude, 4,664 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	144	109	109	114	114	2000	2100	98	47	136	182	134
2	144	109	109	122	131	2000	2030	68	47	150	175	133
3	144	102	102	114	148	2100	1360	54	47	157	175	136
4	144	102	95	106	148	2540	938	40	47	192	169	136
5	144	102	109	106	148	2240	747	47	47	199	162	134
6	137	95	109	98	176	2170	653	40	54	207	162	136
7	137	109	95	98	185	2120	582	40	54	199	162	133
8	130	109	109	106	185	2080	290	47	54	191	162	120
9	137	109	109	106	194	2000	267	98	54	223	162	122
10	130	116	109	114	185	2000	234	98	54	238	162	127
11	130	116	109	166	166	2000	157	106	54	197	159	126
12	130	109	119	176	148	2200	842	114	61	189	157	130
13	123	130	114	140	148	2400	617	106	68	189	155	129
14	123	123	114	131	131	2300	290	148	68	189	152	129
15	123	130	114	122	83	2200	267	68	68	180	150	131
16	116	124	98	114	256	2100	234	54	82	180	147	130
17	116	118	98	106	997	2390	194	54	102	173	144	133
18	109	112	114	98	1260	2400	131	54	116	159	143	133
19	109	106	148	98	1340	2400	68	54	123	166	140	136
20	109	98	157	98	1360	2100	61	54	116	165	137	138
21	102	114	166	98	1470	1970	54	54	109	165	134	141
22	102	130	148	114	1790	1970	47	47	109	165	130	141
23	95	123	131	114	1860	2400	54	40	109	165	130	138
24	95	109	131	106	1630	4220	47	47	109	165	127	137
25	95	109	131	98	1580	3600	47	47	95	159	127	145
26	95	123	114	98	1810	4220	54	47	102	159	127	176
27	95	116	114	98	1920	2870	54	40	109	166	130	165
28	95	116	122	114	2000	2620	54	40	102	166	130	155
29	95	......	122	148	1860	2030	61	47	95	168	134	150
30	95	......	122	140	1840	1970	114	47	109	175	134	145
31	102	......	114	......	1800	....	114	47	......	182	......	135
Total	3645	3168	3655	3461	27063	71610	12762	1945	2411	5514	4460	4254
Mean	118	113	118	115	873	2390	412	62.7	80.4	178	149	137
Max	144	130	166	176	2000	4220	2100	148	123	238	182	176
Min	95	95	95	98	83	1970	47	40	47	136	127	120
Acre-ft.	7260	6280	7260	6840	53700	142000	25300	3860	4780	10900	8870	8420

Discharge of Cache la Poudre at Mouth for 1918.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	161	136	97	78	173	222	80	70	183	190	138
2	......	132	150	90	76	118	112	53	70	190	185	135
3	......	133	163	98	66	79	48	48	68	190	181	135
4	......	139	154	101	71	62	52	46	73	190	172	135
5	......	139	153	108	64	61	68	44	83	192	165	135
6	......	139	150	129	64	59	66	56	106	194	165	138
7	......	139	139	129	60	97	56	100	124	190	172	138
8	......	139	129	121	50	114	46	90	141	176	174	138
9	124	139	128	118	48	125	46	73	144	176	163	......
10	96	139	125	117	47	352	362	68	141	186	156	......
11	117	139	125	113	45	610	494	65	146	190	151	......
12	110	139	121	113	44	848	178	54	156	185	146	......
13	115	146	118	113	43	876	149	46	154	179	141	......
14	118	146	118	114	42	876	338	44	140	181	141	......
15	121	140	111	139	42	988	253	42	128	183	141	......
16	122	135	107	164	41	1280	302	63	138	192	141	......
17	124	153	107	135	40	1070	458	70	159	192	141	......
18	124	152	108	119	40	904	597	72	167	203	115	......
19	131	125	110	111	39	740	532	70	161	203	100	......
20	142	126	112	111	38	506	446	69	146	208	107	......
21	143	128	111	111	38	1040	506	72	135	212	107	......
22	138	140	111	111	36	1320	362	74	125	203	122	......
23	143	160	110	107	38	1610	374	72	116	203	122	......
24	147	160	110	108	38	1320	314	72	112	194	122	......
25	153	150	107	103	38	1130	338	73	105	192	125	......
26	156	135	104	88	47	988	302	73	110	199	125	......
27	150	143	100	84	50	848	302	72	127	199	122	......
28	145	139	101	86	251	688	326	68	165	194	125	......
29	136	......	101	82	289	506	244	68	188	190	132	......
30	133	......	105	74	298	362	145	68	185	185	135	......
31	139	......	100	......	284	......	94	69	......	185	......	......
Total	3027	3955	3724	3294	2445	19750	8132	2034	3883	5939	4284	......
Mean	132	141	120	110	789	658	262	65.6	129	192	143	......
Max	156	161	163	164	298	1610	597	100	188	212	190	......
Min	96	125	100	74	36	59	46	42	68	176	100	......
Acre-ft.	6020	7830	7380	6550	4850	39200	16100	4030	7680	11800	8510	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of North Platte River near North Gate for 1917.
Drainage Area, 1,440 Square Miles. Altitude, 7,600 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	1300	2220	3590	875	275	......	......	......
2	......	......	......	......	1250	2110	3590	820	250	......	......	......
3	......	......	......	......	1250	1780	3460	755	226	......	......	......
4	......	......	......	......	1250	1670	3460	705	212	......	......	......
5	......	......	......	......	1150	2000	3330	640	203	......	......	......
6	......	......	......	......	1050	2000	2940	600	208	......	......	......
7	......	......	......	......	1050	1670	2820	550	235	......	......	......
8	......	......	......	......	1050	1780	2720	520	260	......	......	......
9	......	......	......	......	1150	2000	2530	510	226	......	......	......
10	......	......	......	......	1350	2700	2420	505	221	......	......	......
11	......	......	......	......	1400	3200	2300	505	212	......	......	......
12	......	......	......	......	1560	2700	2180	470	230	......	......	......
13	......	......	......	......	1780	2940	2040	470	230	......	......	......
14	......	......	......	......	2010	3330	1910	505	230	......	......	......
15	......	......	......	......	2970	3460	1820	470	212	......	......	......
16	......	......	......	......	3680	3460	1660	470	208	......	......	......
17	......	......	......	......	4460	3720	1570	470	194	......	......	......
18	......	......	......	......	4840	4110	1440	400	172	......	......	......
19	......	......	......	1890	4840	4240	1380	400	167	......	......	......
20	......	......	......	1780	4580	4500	1360	400	167	......	......	......
21	......	......	......	1450	4460	4370	1340	370	162	......	......	......
22	......	......	......	2010	3940	4240	1310	340	162	......	......	......
23	......	......	......	2850	3160	4110	1230	310	165	......	......	......
24	......	......	......	3350	2730	4110	1170	280	165	......	......	......
25	......	......	......	3350	2610	4110	1110	260	180	......	......	......
26	......	......	......	3090	2490	4110	1050	230	180	......	......	......
27	......	......	......	2970	2490	3980	985	226	190	......	......	......
28	......	......	......	2250	2130	3850	935	245	190	......	......	......
29	......	......	......	1890	2010	3720	920	284	190	......	......	......
30	......	......	......	1350	1890	3590	905	322	190	......	......	......
31	......	......	......	......	2130	......	890	304	......	......	......	......
Total	......	......	......	28230	74010	95780	60374	14211	6112	......	......	......
Mean	......	......	......	2350	2390	3190	1950	458	204	......	......	......
Max	......	......	......	3350	4840	4500	3590	875	275	......	......	......
Min	......	......	......	1350	1050	1670	890	226	162	......	......	......
Acre-ft.	......	......	......	55900	147000	190000	120000	28200	12100	......	......	......

Discharge of North Platte River near North Gate for 1918.
Drainage Area, 1,440 Square Miles. Altitude, 7,600 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	......	......	312	......	......	......	......
2	......	......	......	......	......	......	690	203	......	......	......	......
3	......	......	......	......	......	......	650	......	......	......	......	......
4	......	......	......	......	......	......	690	......	......	......	......	......
5	......	......	......	......	......	......	690	......	......	......	......	......
6	......	......	......	535	......	......	610	......	......	......	......	......
7	......	......	......	570	......	......	570	......	......	......	......	......
8	......	......	......	535	......	2480	570	......	......	......	......	......
9	......	......	......	570	......	2610	570	......	......	......	......	......
10	......	......	......	690	......	2610	570	......	......	......	......	......
11	......	......	......	810	......	2350	730	......	......	......	......	......
12	......	......	......	900	......	......	770	......	......	......	......	......
13	......	......	......	1090	......	......	810	......	......	......	......	......
14	......	......	......	1240	......	......	......	......	......	......	......	......
15	......	......	......	1240	......	......	......	......	......	......	......	......
16	......	......	......	1090	......	......	......	......	......	......	......	......
17	......	......	......	900	......	......	......	......	......	......	......	......
18	......	......	......	900	......	......	900	......	164	......	......	......
19	......	......	......	900	1520	3530	900	......	157	......	......	......
20	......	......	......	770	1410	3530	810	......	148	......	......	......
21	......	......	......	650	1410	3810	690	......	141	......	......	......
22	......	......	......	730	1360	3810	650	......	133	......	......	......
23	......	......	......	......	1300	......	650	......	130	......	......	......
24	......	......	......	......	1360	......	610	160	151	......	......	......
25	......	......	......	......	1410	......	535	154	177	......	......	......
26	......	......	......	......	......	......	380	148	200	......	......	......
27	......	......	......	......	......	......	370	144	205	......	......	......
28	......	......	......	......	......	......	350	138	205	......	......	......
29	......	......	......	......	......	......	321	133	200	......	......	......
30	......	......	......	......	......	......	312	130	191	......	......	......
31	......	......	......	......	......	......	312	144	......	......	......	......

LARAMIE RIVER AT GLENDEVEY

Location.—At highway bridge one-eighth mile west of Glendevey in Sec. 36, T. 10 N., R. 76 W., in the Medicine Bow National Forest; McIntyre Creek enters a short distance below and Nunn Creek above.

Records Available.—June 24, 1904, to October 31, 1905; August 18, 1910, to September 21, 1918.

Drainage Area.—102 square miles.

Gage.—Vertical staff.

Channel.—Permanent.

Discharge Measurements.—Made from bridge during high water and by wading at ordinary stages.

Winter Flow.—Ice causes backwater during the winter months.

Diversions.—There are court decrees for diversions of 65 second-feet from Laramie River above the station and 749 second-feet from tributaries entering above. Of this latter amount 688 second-feet are for diversion into the Cache la Poudre basin.

Accuracy.—Conditions are favorable for excellent results, and the estimates should be reliable.

LARAMIE RIVER NEAR JELM, WYO.

Location.—At highway bridge in Sec. 15, T. 12 N., R. 77 W., 4 miles south of Jelm postoffice, one-fourth mile below the Colorado-Wyoming line.

Records Available.—May 7, 1911, to September 30, 1918. From June 22, 1904, to October 31, 1905, a station was maintained at Decker's ranch, half a mile south of the state line. The records at the two stations are practically comparable, as there are no tributaries nor diversions of any amount between.

Drainage Area.—293 square miles.

Gage.—In 1911 an automatic recording gage was installed. This is referred to the same datum as the vertical staff used at first.

Channel.—Practically permanent.

Discharge Measurements.—Made from bridge.

Winter Flow.—Ice causes backwater during the winter months and the records are discontinued.

Diversions.—Between this station and that at Glendevey, Colo., there are court decrees for diversions of 236 second-feet from Laramie River and 204 second-feet from intervening tributaries. These diversions are all in Colorado.

Accuracy.—Conditions are favorable for accurate results, and the estimates should be excellent.

Discharge of Laramie River at Glendevey for 1917.
Drainage Area, 102 Square Miles. Altitude, 8,231 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	......	527	149	62	36	24	24
2	......	......	......	......	......	......	486	130	75	36	24	......
3	......	......	......	......	......	......	374	140	62	28	28	......
4	......	......	......	......	......	......	527	158	75	28	36	......
5	......	......	......	......	......	......	548	140	62	28	24	......
6	......	......	......	......	......	......	527	158	57	28	28	......
7	......	......	......	......	......	......	466	140	68	24	24	......
8	......	......	......	......	......	447	506	130	52	24	24	......
9	......	......	......	......	......	760	486	149	62	24	28	......
10	......	......	......	......	......	812	527	130	62	24	36	......
11	......	......	......	......	......	922	489	96	68	24	24	......
12	......	......	......	......	......	951	451	122	52	24	28	......
13	......	......	......	......	......	980	413	104	46	24	36	......
14	......	......	......	......	......	980	374	113	46	24	28	......
15	......	......	......	......	......	1220	309	96	62	24	28	......
16	......	......	......	......	......	1250	244	89	41	24	24	......
17	......	......	......	......	......	1130	179	89	41	24	36	......
18	......	......	......	......	......	1250	237	82	52	24	28	......
19	......	......	......	......	......	1250	225	68	57	24	24	......
20	......	......	......	......	......	1220	250	82	46	24	36	......
21	......	......	......	......	......	1220	213	68	46	24	24	......
22	......	......	......	......	......	1340	225	75	68	24	28	......
23	......	......	......	......	......	1220	179	62	46	28	24	......
24	......	......	......	......	......	1160	250	62	57	36	28	......
25	......	......	......	......	......	1040	225	75	68	24	28	......
26	......	......	......	......	......	894	190	75	46	24	36	......
27	......	......	......	......	......	760	202	62	36	28	28	......
28	......	......	......	......	......	638	190	68	46	24	24	......
29	......	......	......	......	......	615	149	75	57	21	24	......
30	......	......	......	......	......	615	158	75	28	24	28	......
31	......	......	......	......	......	......	149	68	......	28	......	......
Total	......	......	......	......	......	22529	10275	3130	1646	805	840	......
Mean	......	......	......	......	......	980	331	101	54.9	25.9	28.0	......
Max	......	......	......	......	......	1340	548	158	75	36	36	......
Min	......	......	......	......	......	......	149	62	28	21	24	......
Acre-ft.	......	......	......	......	......	44700	20400	6210	3270	1590	1670	......

Discharge of Laramie River at Glendevey for 1918.
Drainage Area, 102 Square Miles. Altitude, 8,231 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	36	96	506	168	57	28	......	......	......
2	......	......	......	36	113	592	190	68	36	......	......	......
3	......	......	......	28	190	686	237	57	28	......	......	......
4	......	......	......	36	190	592	168	46	28	......	......	......
5	......	......	......	28	149	735	149	57	28	......	......	......
6	......	......	......	28	190	506	168	46	28	......	......	......
7	......	......	......	36	237	894	168	46	36	......	......	......
8	......	......	......	36	213	894	190	46	36	......	......	......
9	......	......	......	28	168	894	168	57	36	......	......	......
10	......	......	......	36	190	1070	149	46	28	......	......	......
11	......	......	......	28	149	1010	168	46	28	......	......	......
12	......	......	......	36	213	894	149	57	28	......	......	......
13	......	......	......	57	237	1130	190	46	28	......	......	......
14	......	......	......	68	237	951	149	57	28	......	......	......
15	......	......	......	57	213	1130	168	46	28	......	......	......
16	......	......	......	36	237	638	130	46	28	......	......	......
17	......	......	......	36	293	786	130	57	36	......	......	......
18	......	......	......	46	293	894	113	46	36	......	......	......
19	......	......	......	36	506	894	96	46	28	......	......	......
20	......	......	......	36	592	592	130	36	36	......	......	......
21	......	......	......	46	506	638	113	46	28	......	......	......
22	......	......	......	36	638	686	113	46	......	......	......	......
23	......	......	......	46	686	428	82	36	......	......	......	......
24	......	......	......	36	592	506	68	36	......	......	......	......
25	......	......	......	36	548	428	68	36	......	......	......	......
26	......	......	......	46	592	357	82	28	......	......	......	......
27	......	......	......	36	638	392	68	28	......	......	......	......
28	......	......	......	57	686	293	57	36	......	......	......	......
29	......	......	......	68	592	264	57	36	......	......	......	......
30	......	......	......	82	735	149	68	28	......	......	......	......
31	......	......	36	......	638	......	57	36	......	......	......	......
Total	......	......	......	1253	11557	20429	4011	1041	......	......	......	......
Mean	......	......	......	41.8	373	681	129	33.6	......	......	......	......
Max	......	......	......	82	735	1130	237	68	......	......	......	......
Min	......	......	......	28	96	149	57	28	......	......	......	......
Acre-ft.	......	......	......	2490	22900	40500	7930	2070	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Laramie River near Jelm, Wyo., for 1917.
Drainage Area, 293 Square Miles. Altitude, 7,730 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	154	512	2300	305	93	62	52	......
2	......	......	......	......	141	512	2020	288	93	62	62	......
3	......	......	......	......	154	576	1780	269	93	52	62	......
4	......	......	......	......	128	728	1480	269	93	52	62	......
5	......	......	......	......	116	648	1480	232	93	52	62	......
6	......	......	......	......	116	818	1480	218	93	52	52	......
7	......	......	......	......	116	818	1390	202	93	52	52	......
8	......	......	......	......	104	970	1310	202	93	52	52	......
9	......	......	......	......	128	2160	1090	186	93	52	42	......
10	......	......	......	......	141	2460	1090	222	93	52	52	......
11	......	......	......	......	168	2620	1680	205	93	42	62	......
12	......	......	......	......	183	2160	1090	146	82	42	72	......
13	......	......	......	......	199	1900	818	146	82	42	82	......
14	......	......	......	......	309	1900	728	146	82	42	62	......
15	......	......	......	......	512	2300	685	146	82	42	62	......
16	......	......	......	......	770	2460	583	136	82	42	62	......
17	......	......	......	......	970	2300	518	111	82	42	62	......
18	......	......	......	......	1030	2800	432	100	82	42	62	......
19	......	......	......	......	1030	2460	487	111	82	42	62	......
20	......	......	......	......	1030	2460	493	136	82	42	......	......
21	......	......	......	......	1090	2620	437	149	72	42	......	......
22	......	......	......	......	918	2800	386	149	72	42	......	......
23	......	......	......	......	770	2970	339	149	72	33	......	......
24	......	......	......	215	648	2800	470	149	72	24	......	......
25	......	......	......	199	576	2970	416	149	72	24	......	......
26	......	......	......	183	512	2970	470	151	62	33	......	......
27	......	......	......	154	454	2620	391	166	62	33	......	......
28	......	......	......	168	512	2300	367	166	62	42	......	......
29	......	......	......	141	512	2160	284	114	62	42	......	......
30	......	......	......	154	481	2300	305	114	62	52	......	......
31	......	......	......	......	610	......	371	91	......	52	......	......
Total	......	......	......	1214	14582	60072	27170	5323	2431	1379	1138	......
Mean	......	......	......	173	470	2000	876	172	81.0	44.5	59.9	......
Max	......	......	......	215	1090	2970	2300	305	93	62	82	......
Min	......	......	......	141	104	512	284	91	62	24	42	......
Acre-ft.	......	......	......	2400	28900	119000	53900	10600	4820	2740	2260	......

Discharge of Laramie River near Jelm, Wyo., for 1918.
Discharge Area, 293 Square Miles. Altitude, 7,730 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	95	1000	315	112	46	......	......	......
2	......	......	......	......	112	940	277	124	46	......	......	......
3	......	......	......	......	137	1120	259	124	67	......	......	......
4	......	......	......	......	184	1080	259	125	62	......	......	......
5	......	......	......	......	245	1060	241	127	62	......	......	......
6	......	......	......	......	281	1180	234	130	62	......	......	......
7	......	......	......	......	319	1390	259	134	46	......	......	......
8	......	......	......	......	307	1320	224	140	46	......	......	......
9	......	......	......	......	355	1480	241	130	80	......	......	......
10	......	......	......	......	355	1580	296	124	101	......	......	......
11	......	......	......	80	335	1680	315	115	71	......	......	......
12	......	......	......	90	315	1790	241	106	54	......	......	......
13	......	......	......	119	296	1790	400	107	46	......	......	......
14	......	......	......	129	285	1790	510	108	46	......	......	......
15	......	......	......	137	315	1680	347	108	54	......	......	......
16	......	......	......	137	410	1480	296	108	62	......	......	......
17	......	......	......	112	510	1320	315	75	74	......	......	......
18	......	......	......	90	605	1240	259	70	66	......	......	......
19	......	......	......	90	570	1180	224	71	62	......	......	......
20	......	......	......	90	656	1390	208	71	60	......	......	......
21	......	......	......	90	626	1480	241	54	60	......	......	......
22	......	......	......	90	648	1320	234	54	62	......	......	......
23	......	......	......	90	774	960	202	54	62	......	......	......
24	......	......	......	90	1010	910	178	62	62	......	......	......
25	......	......	......	90	1110	765	178	62	62	......	......	......
26	......	......	......	90	1170	570	150	62	62	......	......	......
27	......	......	......	101	1120	510	132	62	62	......	......	......
28	......	......	......	90	1190	400	132	54	62	......	......	......
29	......	......	......	88	1220	364	124	46	62	......	......	......
30	......	......	......	86	1280	335	112	46	62	......	......	......
31	......	......	......	......	1180	......	112	46	......	......	......	......
Total	......	......	......	1979	18015	35104	7515	2811	1831	......	......	......
Mean	......	......	......	99.0	581	1170	242	90.7	61.0	......	......	......
Max	......	......	......	137	1280	1790	510	140	101	......	......	......
Min	......	......	......	80	95	335	112	46	46	......	......	......
Acre-ft.	......	......	......	3930	35700	69600	14900	5580	3630	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

RIO GRANDE DRAINAGE

H. D. Amsley, Hydrographer

RIO GRANDE AT THIRTY-MILE BRIDGE, NEAR CREEDE

Location.—In the Rio Grande National Forest, about 30 miles southwest of Creede, in Sec. 13, T. 40 N., R. 4 W.; a short distance above mouth of Squaw Creek.

Records Available.—June 18, 1909, to November 9, 1918.

Drainage Area.—163 square miles.

Gage.—Staff gage. In still well.

Channel.—Section is gradually filling in.

Discharge Measurements.—Made from car and cable except during low stages, when they are made by wading.

Winter Flow.—Ice causes backwater during the winter months and records are discontinued.

Diversions.—So far as known, no water is diverted above the station.

Artificial Control.—A short distance above the station the San Luis Valley Irrigation District has constructed the large Rio Grande reservoir which materially modifies the flow of the river; also Lost Lake Reservoir.

Accuracy.—Results considered good.

Co-operation.—Station maintained in co-operation with San Luis Valley Irrigation District.

RIO GRANDE AT WASON, NEAR CREEDE

Location.—In the Rio Grande National Forest, at a highway bridge in about Sec. 8, T. 41 N., R. 1 E., a quarter of a mile from Wason siding and 3 miles southeast of Creede. Nearest tributary, Willow or Goblin Creek, enters a short distance upstream.

Records Available.—April 24, 1907, to November 30, 1918.

Drainage Area.—689 square miles.

Gage.—An automatic recording gage.

Channel.—Practically permanent.

Discharge Measurements.—Made from bridge.

Winter Flow.—River frozen over during winter months; ice causes backwater at gage.

Reservoirs.—Daily, monthly and annual discharges modified by storage in the Rio Grande and Santa Maria Reservoirs, 30 miles above.

Diversions.—There are no court decrees for diversions from the Rio Grande above this station, but for diversions of 39 second-feet from tributaries.

Accuracy.—Good.

Co-operation.—Maintained by the State Engineer in co-operation with the United States Forest Service.

Discharge of Rio Grande River at Thirty-Mile Bridge for 1917.
Drainage Area, 163 Square Miles. Altitude, 9,380 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	50	5	5	6	92	310	2690	328	260	101	245	6
2	50	5	5	6	245	310	2690	310	260	101	230	6
3	50	5	5	6	276	292	2750	276	260	101	216	6
4	50	5	5	6	245	292	2320	347	260	101	202	6
5	50	5	5	6	216	245	1930	406	260	101	189	6
6	50	5	5	6	44	245	1310	406	260	101	176	6
7	50	5	5	6	8	516	1120	386	260	101	176	6
8	50	5	5	6	9	739	1120	328	189	101	176	6
9	4	5	5	6	8	1040	1040	347	164	101	164	6
10	4	5	5	6	9	1480	770	406	164	101	164	6
11	4	5	5	6	8	1770	739	427	164	101	164	6
12	4	5	5	6	69	1770	739	427	164	101	164	6
13	4	5	5	6	216	1770	739	427	164	101	152	6
14	4	5	5	6	189	1770	739	448	164	101	44	6
15	4	5	5	6	110	1770	708	448	164	101	6	6
16	4	5	5	7	28	2810	708	427	152	101	6	7
17	4	5	5	7	10	3000	708	427	152	101	6	7
18	4	5	6	7	10	2810	540	427	152	101	6	7
19	4	5	6	7	10	2560	470	347	120	101	6	7
20	4	5	6	7	12	2750	470	328	101	101	6	7
21	4	5	6	7	12	2690	470	310	101	101	6	7
22	4	5	6	7	56	2750	470	310	101	176	6	7
23	4	5	6	7	310	2750	347	310	101	260	6	7
24	4	5	6	7	347	2690	328	260	101	260	6	7
25	4	5	6	7	347	2690	328	260	101	260	6	7
26	4	5	6	8	328	2690	328	260	101	260	6	7
27	4	5	6	8	328	2690	328	260	101	260	6	7
28	4	5	6	8	310	2690	328	260	101	245	6	7
29	4	......	6	8	292	2690	328	260	101	245	6	7
30	4	......	6	8	292	2690	328	260	101	245	6	7
31	4	......	6	......	292	......	328	260	......	245	......	7
Total	492	140	169	200	4728	55269	28211	10683	4844	4577	2558	202
Mean....	15.9	5.0	5.5	6.7	153	1840	910	345	161	148	85.3	6.5
Max.	50	5	6	8	347	3000	2690	448	260	260	245	7
Min.......	4	5	5	6	8	245	328	260	101	101	6	6
Acre-ft.	978	278	338	399	9410	109000	56000	21200	9580	9100	5080	400

Discharge of Rio Grande at Thirty-Mile Bridge for 1918.
Drainage Area, 163 Square Miles. Altitude, 9,380 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7	8	8	8	325	500	241	588	86	2	38	......
2	7	8	8	8	325	500	241	529	86	2	188	......
3	7	8	8	8	348	558	241	473	97	2	188	......
4	7	8	8	8	348	618	281	325	120	2	188	......
5	7	8	8	8	348	814	302	222	108	2	173	......
6	7	8	8	9	396	924	302	173	97	2	77	......
7	7	8	8	9	529	814	302	145	86	2	26	......
8	7	8	8	9	588	680	302	120	97	2	26	......
9	7	8	8	9	500	850	302	120	145	2	26	......
10	7	8	8	9	473	1040	325	145	260	3	......	......
11	7	8	8	9	473	1080	348	145	302	132	......	......
12	7	8	8	9	446	1080	281	132	32	241	......	......
13	7	8	8	9	372	1040	241	132	1	86	......	......
14	7	8	8	9	396	1040	241	158	1	68	......	......
15	7	8	8	9	421	1000	222	158	1	241	......	......
16	8	8	8	9	473	962	173	145	1	241	......	......
17	8	8	8	9	529	713	97	158	1	241	......	......
18	8	8	8	9	558	473	68	132	1	222	......	......
19	8	8	8	45	588	558	68	132	1	222	......	......
20	8	8	8	188	618	618	68	120	1	222	......	......
21	8	8	8	145	618	473	68	205	1	68	......	......
22	8	8	8	132	588	529	145	188	1	12	......	......
23	8	8	8	145	618	618	222	158	1	5	......	......
24	8	8	8	205	680	500	188	120	1	2	......	......
25	8	8	8	260	713	421	173	108	1	2	......	......
26	8	8	8	325	713	421	158	97	1	3	......	......
27	8	8	8	325	680	421	132	97	1	3	......	......
28	8	8	8	302	649	348	132	97	1	3	......	......
29	8	......	8	302	618	260	281	108	2	3	......	......
30	8	......	8	325	558	241	473	97	2	3	......	......
31	8	......	8	......	500	......	618	97	......	3	......	......
Total	233	224	248	2856	15989	20094	7236	5624	1536	2044	930	......
Mean....	7.52	8.00	8.00	95.2	516	670	233	181	51.2	65.9	103	......
Max.	8	8	8	325	713	1080	618	588	302	241	......	......
Min.......	7	8	8	8	325	241	68	97	1	2	......	......
Acre-ft.	462	444	492	5660	31700	39900	14300	11100	3050	4050	1836	......

Unless otherwise noted, all discharges are in cubic feet per second.
Reservoir gates opened April 19th.

Discharge of Rio Grande River at Wason for 1917.

Drainage Area, 700 Square Miles. Altitude, 8,591 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	156	392	1180	3930	1090	592	293	392	69
2	......	......	......	133	624	1130	3600	1090	562	293	366	69
3	......	......	......	122	691	1320	3300	958	562	293	366	69
4	......	......	......	112	763	1600	3100	958	562	270	341	70
5	......	......	......	133	691	1800	2700	1040	562	270	341	70
6	......	......	......	144	592	1550	2510	958	532	270	316	80
7	......	......	......	182	446	1960	2570	1000	532	270	293	85
8	......	......	......	270	418	2570	2690	918	532	270	293	85
9	......	......	......	250	392	3510	2630	839	446	270	293	80
10	......	......	......	230	392	4280	2220	878	446	270	270	80
11	......	......	......	270	474	4420	2120	958	446	270	270	85
12	......	......	......	341	532	4420	2060	958	446	270	270	85
13	......	......	......	316	726	4780	2010	1000	446	270	270	90
14	......	......	......	270	1270	5080	1910	1000	474	270	250	90
15	......	......	......	230	1750	5310	1800	958	474	270	156	95
16	......	......	......	182	1750	5610	1750	958	446	270	122	100
17	......	......	......	144	1800	5540	1700	958	418	270	94	110
18	......	......	......	144	1910	5240	1550	958	418	250	80	105
19	......	......	......	144	1750	5240	1550	918	418	230	80	109
20	......	......	112	144	1320	5240	1600	800	366	250	74	110
21	......	......	112	168	1040	5160	1510	763	341	250	74	115
22	......	......	112	196	1000	4860	1510	726	341	250	69	115
23	......	......	112	366	1320	4940	1410	691	366	366	69	110
24	......	......	112	532	1270	4940	1220	656	366	392	69	100
25	......	......	112	691	1270	4940	1220	656	366	418	69	100
26	......	......	112	763	1180	4860	1220	624	341	418	69	100
27	......	......	122	592	1040	4710	1320	624	341	418	69	100
28	......	......	133	503	1090	4640	1220	624	316	392	69	100
29	......	......	156	446	1180	4490	1180	624	293	418	69	100
30	......	......	230	366	1270	4280	1220	624	293	418	69	100
31	......	......	230	......	1270	......	1180	592	......	418	......	100
Total	......	......	1655	8540	31613	119600	61510	26399	13044	9547	5632	2876
Mean	......	......	138	285	1020	3990	1980	852	435	308	188	92.8
Max.	......	......	230	763	1910	5610	3930	1090	592	418	362	115
Min.	......	......	112	112	392	1130	1180	592	293	230	69	69
Acre-ft.	......	......	3280	17000	62700	237000	122000	52400	25900	18900	11200	5710

Discharge of Rio Grande at Wason for 1918.

Drainage Area, 700 Square Miles. Altitude, 8,591 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	100	90	100	180	562	1020	700	940	450	194	145	......
2	100	90	100	168	562	1070	700	940	425	194	134	......
3	100	90	100	156	562	1430	739	940	400	180	224	......
4	100	85	110	156	664	1530	778	899	450	180	274	......
5	100	85	110	144	700	1530	818	818	400	180	293	......
6	100	85	115	156	778	1990	858	778	354	180	293	......
7	100	85	115	168	899	1990	899	739	354	180	194	......
8	95	85	120	145	982	1730	899	664	333	180	168	......
9	95	85	125	168	982	1730	899	628	504	180	168	......
10	95	85	125	180	899	2160	899	664	1260	168	180	......
11	95	85	125	194	858	2220	858	628	1070	168	180	......
12	95	90	124	208	818	2110	778	595	700	333	168	......
13	95	90	145	208	778	2050	778	595	450	400	156	......
14	95	90	134	208	899	2000	739	739	425	208	150	......
15	95	90	124	208	1110	2000	739	818	377	274	145	......
16	95	90	134	194	1340	1780	739	739	377	333	124	......
17	95	90	134	180	1290	1580	664	700	333	354	114	......
18	95	90	145	168	1430	1290	533	595	312	377	124	......
19	90	90	145	168	1530	1250	450	595	293	377	124	......
20	90	90	145	257	1630	1290	425	664	274	377	134	......
21	90	90	145	312	1530	1290	400	700	257	377	124	......
22	90	90	145	312	1430	1340	425	700	240	224	114	......
23	90	95	145	312	1530	1390	533	664	240	194	114	......
24	90	95	156	354	1730	1340	504	628	240	168	124	......
25	90	95	156	425	1730	1110	504	595	224	156	124	......
26	90	95	156	504	1680	1070	450	504	224	156	124	......
27	90	95	156	533	1580	1020	425	477	224	145	120	......
28	90	95	156	533	1480	940	450	450	208	145	120	......
29	90	......	156	533	1340	739	504	450	208	134	120	......
30	90	......	194	562	1250	700	739	450	208	145	120	......
31	90	......	194	......	1110	......	858	450	......	145	......	......
Total	2915	2510	4234	7994	35663	44689	20684	20746	11814	7006	4572	......
Mean	94.0	89.6	137	266	1150	1490	667	669	394	226	152	......
Max.	100	95	194	562	1730	2220	899	940	1260	377	293	......
Min.	90	85	100	144	562	700	400	450	208	134	114	......
Acre-ft.	5780	4980	8420	15800	70700	88700	41000	41100	23400	13900	9040	......

Unless otherwise noted, all discharges are in cubic feet per second.
Discharge estimated January 1st to March 11th.

RIO GRANDE NEAR DEL NORTE

Location.—At highway bridge in about Sec. 30, T. 40 N., R. 5 E., 6 miles west of Del Norte, a short distance below the mouth of Wolf Creek. From October 11, 1889, to November 30, 1906, a station was maintained about 4 miles below the present station and just above Los Pinos Creek. The flow at the two points is comparable, if a few small ditches are disregarded.

Records Available.—May 16, 1908, to November 30, 1918.

Drainage Area.—1,400 square miles.

Gage.—Automatic recording gage. The gage is referred to the same datum as was the chain gage installed May 16, 1908.

Channel.—Slightly shifting at sides from silt deposition at low water.

Discharge Measurements.—Made from bridge.

Winter Flow.—River is frozen over during the winter months.

Reservoirs.—Daily, monthly and annual discharges modified by storage in Beaver Park, Santa Maria and Rio Grande Reservoirs.

Diversions.—There are court decrees for diversions of 101 second-feet from the Rio Grande between the Creede station and Del Norte, and for diversions of 162 second-feet from intervening tributaries.

RIO GRANDE AT ALAMOSA

Location.—At Concrete road bridge in Alamosa, one-third of a mile above D. & R. G. Railroad bridge, where station was originally established in 1894, discontinued in 1895, and re-established in 1912. The flow at the two points is comparable, except for one small ditch diversion. Records initiated by State of Colorado April 19, 1914.

Records Available.—Discharge measurements and gage heights September 24, 1894, to December 31, 1895. Miscellaneous measurements, 1903 and 1910. Daily discharges May 15, 1912, to November 30, 1918.

Drainage Area.—Not measured.

Gage.—An automatic recording gage.

Channel.—Shifting sand.

Discharge Measurements.—From Concrete road bridge at high water and by wading at low water.

Winter Flow.—Ice cover forms during winter months.

Diversions.—Below all but one of the large diversions from the Rio Grande.

Discharge of Rio Grande River at Del Norte for 1917.
Drainage Area, 1,400 Square Miles. Altitude, 7,868 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	425	695	2090	6260	1380	780	395	520	132
2	......	......	......	370	1020	1880	6020	1330	780	395	488	145
3	......	......	......	320	1170	2460	5540	1170	735	395	488	145
4	......	......	......	320	1280	2850	5190	1120	655	395	455	175
5	......	......	......	370	1220	3260	4630	1280	655	395	425	160
6	......	......	......	395	915	2850	4210	1220	620	370	425	132
7	......	......	......	395	825	3440	3720	1220	620	370	395	132
8	......	......	......	455	735	4010	4010	1170	695	370	395	132
9	......	......	......	655	695	5540	3910	1020	620	395	425	140
10	......	......	......	620	695	6650	3440	1060	585	370	395	140
11	......	......	......	585	870	7040	3180	1060	552	370	395	150
12	......	......	......	620	915	7710	3180	1120	655	370	395	155
13	......	......	......	735	1120	7440	3010	1280	585	370	370	170
14	......	......	......	695	1950	7840	2770	1220	620	370	370	180
15	......	......	......	620	2930	8250	2610	1170	655	370	370	190
16	......	......	......	552	3260	8250	2530	1170	585	370	250	190
17	......	......	......	488	3620	8120	2380	1220	552	370	250	190
18	......	......	......	455	3720	7580	2230	1220	552	345	250	180
19	......	......	......	370	3440	7580	2230	1170	520	320	160	203
20	......	......	......	345	2460	7580	2380	1060	488	345	160	200
21	......	......	259	395	2020	7440	2160	965	455	370	160	200
22	......	......	280	455	2020	6910	2090	965	455	370	160	205
23	......	......	300	825	2300	7170	1950	915	455	425	160	205
24	......	......	325	965	2380	7040	1740	915	520	488	145	205
25	......	......	345	1280	2160	7170	1680	825	488	520	160	200
26	......	......	345	1500	2020	7040	1810	735	455	520	145	200
27	......	......	320	1330	1810	6780	1740	735	455	520	145	200
28	......	......	345	965	2020	6520	1560	870	425	520	132	200
29	......	......	455	915	2230	6390	1560	825	425	488	145	200
30	......	......	585	695	2300	6390	1560	825	395	520	145	200
31	......	......	552	......	2460	......	1500	780	......	520	......	200
Total	......	......	4111	19115	57255	181270	92780	33015	17037	12711	8878	5456
Mean	......	......	374	637	1850	6040	2990	1060	568	410	296	176
Max.	......	......	585	1500	3720	8250	6260	1380	780	520	520	205
Min.	......	......	259	320	695	1880	1500	735	395	320	132	132
Acre-ft.	......	......	8150	57900	114000	359000	184000	65200	33800	25200	17600	10800

Discharge of Rio Grande River at Del Norte for 1918.
Drainage Area, 1,400 Square Miles. Altitude, 7,868 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	195	185	230	345	1120	1560	1020	1060	552	320	272	......
2	195	185	240	345	1120	1680	965	1120	552	320	272	......
3	195	185	240	345	1060	2160	1020	1060	520	320	295	......
4	195	180	240	295	1220	2460	1120	1020	552	295	425	......
5	195	180	255	272	1330	2770	1120	915	620	295	585	......
6	195	180	255	250	1440	3180	1120	825	552	295	425	......
7	195	180	260	210	1620	3260	1220	780	488	272	395	......
8	195	180	260	250	1620	2690	1280	695	455	272	272	......
9	195	185	270	320	1560	2690	1330	695	488	295	210	......
10	195	185	270	395	1560	3350	1380	825	1020	295	250	......
11	190	185	280	425	1440	3720	1280	780	1680	295	272	......
12	190	185	280	488	1280	3530	1330	735	1330	320	272	......
13	190	190	290	488	1280	3620	1170	695	870	455	250	......
14	190	190	290	455	1500	3260	1170	965	695	455	272	......
15	190	190	290	425	1810	3260	1220	1120	585	345	272	......
16	190	190	300	395	2160	2930	1380	965	552	455	210	......
17	190	195	300	370	2090	2690	1280	870	552	488	175	......
18	190	195	320	320	2380	2160	1060	825	520	552	192	......
19	190	197	295	295	2460	2020	870	695	488	552	230	......
20	190	200	250	250	2690	2020	825	655	425	585	250	......
21	185	200	230	520	2460	1950	825	695	425	585	210	......
22	185	200	192	455	2230	2160	825	825	425	520	210	......
23	185	210	210	488	2380	2160	915	780	395	345	192	......
24	185	210	230	552	2690	2230	915	695	395	345	210	......
25	185	220	250	735	2610	1880	870	655	370	330	230	......
26	185	220	272	870	2610	1740	825	620	370	295	210	......
27	185	230	295	965	2380	1500	735	620	370	295	210	......
28	185	230	320	915	2230	1330	695	585	345	295	210	......
29	185	......	272	1020	2160	1120	695	620	345	295	210	......
30	185	......	250	1020	1950	1020	870	585	320	272	210	......
31	185	......	345	......	1740	......	870	552	......	272	......	......
Total	5885	5162	8281	14478	58180	72100	32200	24532	17256	11330	7898	......
Mean	190	195	267	483	1880	2400	1040	791	575	365	263	......
Max.	195	230	345	1020	2690	3720	1380	1120	1680	585	585	......
Min.	185	180	192	210	1060	1020	695	552	320	272	175	......
Acre-ft.	11700	10800	16400	28700	116000	143000	64000	48600	34200	22400	15600	......

Unless otherwise noted, all discharges are in cubic feet per second.
Discharge estimated January 1st to March 18th.

Discharge of Rio Grande River at Alamosa for 1917.

Drainage Area, ... Square Miles. Altitude, 7,536 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	290	125	650	4060	275	90	100	260	245
2	......	......	......	275	112	510	4060	230	90	100	290	245
3	......	......	......	200	138	410	3900	215	90	100	290	245
4	......	......	......	230	175	532	3900	200	90	112	290	260
5	......	......	......	250	188	930	3280	200	80	138	290	260
6	......	......	......	230	215	1280	2760	200	80	138	290	290
7	......	......	......	250	355	990	2300	188	70	125	290	275
8	......	......	......	250	320	1100	1960	175	70	125	275	245
9	......	......	......	280	275	1440	2010	175	70	138	275	245
10	......	......	......	380	245	2240	2060	162	70	150	275	245
11	......	......	......	350	188	3350	1910	162	70	150	275	230
12	......	......	......	325	175	4580	1660	162	80	138	290	230
13	......	......	......	350	200	4850	1580	175	80	138	305	240
14	......	......	245	430	245	4940	1480	188	100	125	320	225
15	......	......	245	355	510	5120	1280	188	100	125	338	215
16	......	......	245	430	1200	5480	1130	175	112	125	355	210
17	......	......	245	490	1480	5770	1020	175	125	125	320	200
18	......	......	245	470	1440	5960	870	175	112	112	275	200
19	......	......	250	372	2060	5580	725	175	100	100	275	200
20	......	......	250	305	2060	5390	625	175	100	100	260	194
21	......	......	250	230	1440	5390	600	150	112	100	275	210
22	......	......	260	162	990	5210	578	138	112	100	275	210
23	......	......	260	138	930	4940	510	125	112	90	290	210
24	......	......	260	125	930	4760	470	125	112	90	275	220
25	......	......	260	245	930	4850	410	112	112	90	260	220
26	......	......	245	410	810	4850	355	112	125	100	260	220
27	......	......	245	450	675	4760	338	112	112	112	260	210
28	......	......	260	430	510	4670	305	112	112	138	260	210
29	......	......	290	260	532	4490	275	112	112	162	245	210
30	......	......	372	162	578	4150	260	112	100	200	230	210
31	......	......	390	......	650	......	260	100	......	245	......	210
Total	......	......	4817	9124	20681	109172	46931	5080	2900	3891	8468	7039
Mean....	......	......	268	304	667	3640	1510	164	96.6	126	282	227
Max.	......	......	390	490	2060	5960	4060	275	125	245	355	290
Min.......	......	......	245	125	112	410	260	100	70	90	230	194
Acre-ft.	......	......	9550	18100	41000	217000	92800	10100	5750	7750	16800	14000

Discharge of Rio Grande River at Alamosa for 1918.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	200	190	270	289	59	18	55	26	15	141	38	......
2	200	190	250	257	45	18	45	21	15	141	89	......
3	200	190	292	283	38	18	45	14	15	130	130	......
4	200	190	280	212	25	146	45	14	25	99	141	......
5	200	190	268	158	26	249	51	14	20	89	141	......
6	190	195	283	99	26	238	51	12	32	79	165	......
7	190	195	301	87	39	199	59	10	93	61	178	......
8	190	195	320	85	91	148	68	10	126	61	204	......
9	190	202	320	83	101	113	75	9	137	53	230	......
10	190	205	292	72	74	74	85	8	163	53	257	......
11	180	205	277	70	56	113	148	7	314	53	230	......
12	180	205	280	70	41	207	134	7	880	53	204	......
13	180	215	295	70	41	207	123	7	830	53	204	......
14	180	215	298	81	35	207	123	8	623	53	204	......
15	180	215	333	81	35	178	91	8	490	53	204	......
16	175	225	352	72	35	141	91	8	441	53	230	......
17	175	225	320	63	95	119	119	10	407	45	243	......
18	175	225	292	56	128	99	153	8	411	38	243	......
19	174	235	295	48	151	77	130	8	375	45	230	......
20	175	235	295	48	163	68	99	9	323	70	230	......
21	175	235	314	41	163	77	97	9	289	89	243	......
22	180	239	317	41	119	75	87	9	257	109	243	......
23	180	240	286	42	79	126	87	10	227	119	230	......
24	180	240	289	42	38	126	77	10	209	89	243	......
25	180	240	304	42	38	103	66	11	220	61	285	......
26	185	260	324	66	38	74	66	11	243	53	270	......
27	185	270	327	105	38	65	50	38	240	53	255	......
28	185	270	330	77	32	55	42	21	225	53	270	......
29	185	......	330	59	26	55	41	18	183	45	270	......
30	185	......	311	51	21	55	41	18	155	45	285	......
31	185	......	292	......	18	......	41	15	......	45	......	......
Total	5729	6136	9337	2850	1914	3448	2485	388	7983	2184	6389	......
Mean....	185	219	301	95.0	61.7	115	80.2	12.5	266	70.5	213	......
Max.	200	270	352	289	163	249	153	38	880	141	285	......
Min.......	174	190	250	41	18	18	41	7	15	38	38	......
Acre-ft.	11400	12200	18500	5650	3790	6840	4930	769	15800	4330	12700	......

Unless otherwise noted, all discharges are in cubic feet per second.
Discharge estimated January 1st to March 3rd.

RIO GRANDE NEAR LOBATOS

Location.—At highway bridge in Sec. 22, T. 33 N., R. 11 E., 10 miles east of Lobatos and a few miles above the Colorado-New Mexico line; 17 miles below mouth of Conejos River.

Records Available.—June 28, 1899, to November 30, 1918.

Drainage Area.—7,700 square miles.

Gage.—Automatic recording gage. This gage is referred to the datum of the original gage.

Channel.—A gash cut in lava rock; shifting blanket of sand.

Discharge Measurements.—Made from bridge during high stages and by wading at low stages.

Winter Flow.—Ice causes backwater varying in amount during the three winter months.

Diversions.—There are court decrees for diversions from the Rio Grande of 5,134 second-feet between the Del Norte station and this one. There are also decrees for diversions from the following tributaries: Minor tributaries above Alamosa, 464 second-feet; Alamosa and tributaries, 2,116 second-feet; Conejos and tributaries, 3,464 second-feet; Culebra and tributaries, 177 second-feet.

SOUTH FORK OF RIO GRANDE AT SOUTH FORK

Location.—At highway bridge half a mile west of South Fork station, in Sec. 34, T. 40 N., R. 3 E. No tributaries between the station and the mouth and none for several miles above.

Records Available.—August 9, 1910, to November 9, 1918. Also a number of discharge measurements made in 1909 by the United States Geological Survey.

Drainage Area.—216 square miles.

Gage.—Chain gage established May 12, 1912, at the side of the original gage, but referred to a different datum. The original gage was washed out by flood October 5, 1911, and was replaced by an inclined staff gage at the railroad bridge at different datum, October 16, 1911. This gage was read until May 12, 1912.

Channel.—Gradually getting lower.

Discharge Measurements.—Made from bridge.

Winter Flow.—Ice causes backwater during the winter months.

Reservoirs.—Daily and monthly discharges modified by storage in Beaver Park Reservoir.

Diversions.—There are court decrees for diversions of 11 second-feet from South Fork above the station; none below.

Discharge of Rio Grande Near Lobatos for 1917.

Drainage Area, 7,700 Square Miles. Altitude, 7,440 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	875	780	1980	5830	488	200	180	320	320
2	......	......	......	875	605	1740	5740	450	180	180	350	350
3	......	......	......	780	450	1450	5660	415	145	180	350	380
4	......	......	......	605	565	1680	5320	380	145	180	380	415
5	......	......	......	605	690	1980	4980	320	132	180	415	380
6	......	......	......	525	780	2370	4580	320	145	180	380	400
7	......	......	......	525	828	2240	4200	320	132	180	380	400
8	......	......	......	605	925	2050	3600	295	132	200	380	430
9	......	......	......	605	925	2370	3460	270	120	200	350	415
10	......	......	......	780	828	3180	3390	270	120	180	350	380
11	......	......	......	975	780	4050	3390	270	132	245	350	380
12	......	......	......	975	780	4500	3180	270	132	220	350	380
13	......	......	......	975	735	5240	2900	270	132	220	350	340
14	......	......	......	975	875	5830	2630	270	145	220	350	375
15	......	......	525	1180	1280	6260	2370	270	162	245	380	360
16	......	......	605	1340	2560	6600	2110	295	162	220	450	340
17	......	......	875	1280	3680	6760	1980	295	180	220	450	330
18	......	......	565	975	4420	7210	1740	320	180	200	415	330
19	......	......	488	780	4820	7390	1450	320	180	180	350	350
20	......	......	565	605	4980	7750	1340	320	180	162	380	350
21	......	......	488	488	4350	7300	1180	270	162	180	350	330
22	......	......	525	415	3040	7210	1180	270	180	180	350	300
23	......	......	525	415	2630	7120	1280	270	180	180	380	300
24	......	......	488	605	2630	7030	975	245	180	180	380	300
25	......	......	525	1080	2500	6600	875	245	180	180	415	340
26	......	......	525	1620	2240	6510	780	220	180	180	380	360
27	......	......	450	2050	1860	6420	690	220	180	180	380	360
28	......	......	525	2110	1620	6340	648	180	180	200	380	380
29	......	......	525	1510	1450	6170	605	180	162	200	415	345
30	......	......	525	1020	1740	6000	565	180	180	200	380	320
31	......	......	605	......	1860	......	605	180	......	245	......	320
Total	......	......	9329	28153	58206	149330	79233	8888	4800	6077	11290	11060
Mean....	......	......	549	938	1880	4980	2560	287	160	196	376	357
Max.	......	......	875	2110	4980	7750	5830	488	200	245	450	430
Min.......	......	......	450	415	450	1450	565	180	120	180	320	300
Acre-ft.	......	......	18500	55800	116000	296000	157000	17600	9520	12100	22400	22000

Discharge of Rio Grande at Lobatos for 1918.

Drainage Area, 7,700 Square Miles. Altitude, 7,440 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	300	290	570	525	320	295	320	100	61	270	134	......
2	300	290	600	525	320	270	245	86	61	245	134	......
3	300	290	605	488	350	270	174	86	72	220	154	......
4	300	290	690	488	350	295	154	72	86	220	245	......
5	285	290	648	450	450	295	134	61	86	220	220	......
6	285	300	605	350	450	565	134	50	117	197	220	......
7	285	300	605	295	525	1020	174	40	100	174	245	......
8	285	300	605	270	605	1510	197	30	154	154	270	......
9	285	320	648	270	648	1230	270	30	270	174	245	......
10	285	320	605	245	605	1020	380	30	270	154	270	......
11	285	320	525	220	565	1130	320	30	270	134	320	......
12	275	340	525	220	450	1280	380	40	380	154	320	......
13	275	340	565	197	380	1400	450	40	975	154	295	......
14	275	340	525	220	320	1510	488	50	1130	154	295	......
15	275	360	525	220	350	1570	525	72	875	154	295	......
16	275	360	525	220	415	1510	648	50	690	134	295	......
17	270	360	488	265	565	1400	735	50	605	134	320	......
18	270	380	450	220	565	1230	690	50	525	134	320	......
19	270	380	450	197	605	875	605	50	525	134	350	......
20	270	400	450	154	565	735	565	40	488	134	350	......
21	270	400	450	154	605	648	525	40	450	154	380	......
22	267	420	450	154	525	648	450	50	415	174	380	......
23	270	439	450	134	450	780	380	50	415	174	350	......
24	280	460	450	117	380	875	320	50	350	220	380	......
25	280	480	450	100	415	875	270	50	295	197	565	......
26	280	510	488	117	415	828	220	50	320	154	525	......
27	280	540	525	154	450	735	220	50	350	154	450	......
28	280	540	525	245	415	605	197	50	350	174	525	......
29	280	......	525	270	380	488	174	50	320	154	525	......
30	280	......	525	295	380	415	154	50	320	134	565	......
31	280	......	565	......	350	......	134	50	......	134	......	......
Total	8697	10359	16612	7779	14168	26307	10632	1587	11325	5271	9942	......
Mean....	281	370	536	259	457	877	343	51.2	378	170	331	......
Max.	300	540	690	525	648	1570	735	100	1130	270	565	......
Min.......	267	290	450	100	320	270	134	30	61	134	134	......
Acre-ft.	17300	20500	33000	15400	28100	52200	21100	3150	22500	10500	19700	......

Unless otherwise noted, all discharges are in cubic feet per second.
Discharge estimated January 1st to March 3rd.

Discharge of South Fork Rio Grande River at South Fork for 1917.
Drainage Area, 216 Square Miles. Altitude, 8,176 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	120	228	608	1670	235	132	64	50	40
2	......	......	......	110	244	608	1570	220	122	71	50	40
3	......	......	......	95	280	758	1380	220	112	64	50	40
4	......	......	......	100	298	996	1210	220	94	57	50	40
5	......	......	......	100	318	1070	1090	206	94	57	57	40
6	......	......	......	115	298	1070	1090	178	78	57	57	40
7	......	......	......	130	262	1180	1052	192	78	50	50	35
8	......	......	......	140	244	1310	1170	178	78	57	50	35
9	......	......	......	180	228	1680	1130	166	78	57	50	35
10	......	......	......	220	212	1980	1010	154	78	57	43	35
11	......	......	......	155	212	1980	940	143	78	50	43	35
12	......	......	......	205	228	2030	904	143	94	50	43	35
13	......	......	......	260	280	2030	836	178	94	50	43	30
14	......	......	......	290	500	2030	742	166	103	50	43	30
15	......	......	......	240	726	2180	684	154	103	50	43	33
16	......	......	......	190	924	2270	604	143	94	50	43	33
17	......	......	......	175	996	2070	554	154	86	50	43	30
18	......	......	......	160	1030	2020	530	154	86	50	43	30
19	......	......	37	145	960	2070	554	143	86	50	50	30
20	......	......	......	130	790	2020	554	132	86	50	50	30
21	......	......	......	125	664	1970	484	122	86	50	50	30
22	......	......	......	115	580	1870	462	112	86	50	50	30
23	......	......	......	225	608	1870	420	112	86	43	50	30
24	......	......	......	335	636	1870	400	112	86	43	43	27
25	......	......	......	450	580	1920	380	103	78	43	43	27
26	......	......	......	435	526	1870	440	112	64	50	43	27
27	......	......	......	420	476	1820	380	143	64	50	43	27
28	......	......	......	404	552	1770	320	166	57	50	40	27
29	......	......	......	298	636	1720	320	154	57	50	40	30
30	......	......	......	262	664	1670	302	143	57	50	40	30
31	......	......	......	......	664	......	284	132	......	50	......	30
Total	......	......	......	6329	15844	50310	23466	4890	2575	1620	1393	1011
Mean	......	......	......	211	511	1680	757	158	85.8	52.3	46.4	32.6
Max.	......	......	......	450	1020	2270	1670	235	132	71	57	40
Min.	......	......	......	95	212	608	284	103	57	43	40	27
Acre-ft.	......	......	......	12600	31400	100000	46500	9720	5110	3220	2760	2000

Discharge of South Fork Rio Grande at South Fork for 1918.
Drainage Area, 216 Square Miles. Altitude, 8;176 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	30	34	40	103	320	507	238	102	70	63	38	......
2	30	34	40	103	302	578	224	94	63	56	38	......
3	30	34	45	103	302	657	253	102	63	56	32	......
4	30	34	45	103	340	657	268	102	86	56	32	......
5	30	34	50	86	360	773	285	102	111	56	44	......
6	30	34	50	86	380	804	302	102	111	56	56	......
7	30	34	55	94	400	804	285	102	94	56	63	......
8	30	34	55	94	380	742	268	102	78	56	70	......
9	30	34	60	112	380	773	302	102	86	50	70	......
10	30	34	65	143	400	870	268	102	140	50	78	......
11	30	32	70	154	360	977	253	94	210	50	78	....
12	30	32	75	166	302	977	268	86	184	50	70	......
13	30	32	78	166	284	1050	238	86	150	44	63	......
14	30	32	78	166	380	1050	210	150	111	44	56	....
15	30	32	75	154	440	1030	210	172	102	44	50	......
16	32	32	80	143	507	964	253	150	86	44	60	......
17	32	32	80	132	507	900	238	140	86	44	65	......
18	32	32	80	122	554	838	210	130	86	44	75	......
19	32	32	80	112	554	744	197	111	78	44	78	......
20	32	32	78	103	578	714	184	86	78	38	80	......
21	32	32	75	103	530	658	184	86	78	38	70	......
22	32	32	70	103	530	774	172	86	78	38	65	......
23	32	34	73	122	604	632	172	86	70	38	56	......
24	32	34	75	132	684	632	150	86	70	38	60	......
25	32	34	80	206	657	556	160	86	70	38	60	......
26	34	34	86	235	684	508	130	94	70	38	55	......
27	34	36	86	235	657	418	111	86	70	38	55	......
28	34	40	86	267	657	357	111	78	63	38	50	......
29	34	......	86	302	657	320	102	70	63	38	50	......
30	34	......	94	320	604	268	102	70	63	38	50	......
31	34	......	94	......	530	......	102	70	......	38	......	......
Total	974	936	2184	4470	14824	21532	6450	3115	2768	1419	1767	......
Mean	31.4	33.4	70.5	149	478	718	208	100	92.3	45.8	58.9	......
Max.	34	40	94	320	684	1050	302	172	210	63	80	......
Min.	30	32	40	86	284	268	102	70	63	38	32	......
Acre-ft.	1930	1850	4330	8870	29400	42700	12800	6150	5490	2820	3500	......

Unless otherwise noted, all discharges are in cubic feet per second.
Discharge estimated January 1st to March 26th.

SAGUACHE CREEK NEAR SAGUACHE

Location.—At Ward's Ranch below the dam site of the Stark-Hagadorn Irrigation Co., 10 miles above Saguache. Ford Creek, the nearest important tributary, enters some distance below.

Records Available.—August 7, 1910, to September 23, 1912; June 1, 1914, to November 30, 1918.

Drainage Area.—595 square miles.

Gage.—An automatic recording gage.

Channel.—Shifting.

Discharge Measurements.—Made from footbridge during high water and by wading at ordinary stages.

Winter Flow.—Ice causes backwater during the winter months.

Diversions.—There are court decrees for diversions of 46 second-feet from Saguache Creek above the station, and 365 second-feet below.

ALAMOSA RIVER ABOVE TERRACE RESERVOIR

Location.—Four miles above Terrace Dam in Sec. 8, T. 36 N., R. 6 E., of New Mexico meridian.

Records Available.—April 25, 1914, to August 31, 1918. For records of flow of Alamosa River prior to April 25, 1914, see station below reservoir.

Gage.—Vertical staff bolted to cribbing support for cable. Datum has remained unchanged. Bristol recording gage installed May 7, 1915. Referred to staff gage.

Channel.—Shifts during high water.

Discharge Measurements.—Made from cable and car at high stages and by wading at low stages.

Winter Flow.—Affected by ice and station discontinued during the winter months.

Diversions.—There are no decreed diversions above this station.

Accuracy.—Although the channel shifts somewhat, enough measurements have been obtained to make the estimates of discharge reliable.

Co-operation.—Station maintained in co-operation with the Terrace Irrigation District.

Discharge of Saguache Creek Near Saguache for 1917.

Drainage Area, 595 Square Miles. Altitude, 7,800 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	30	50	67	192	270	108	47	42	42	27
2	......	......	30	50	73	184	259	101	47	42	37	27
3	......	......	30	50	85	168	248	94	42	42	37	27
4	......	......	30	56	85	201	218	94	42	42	37	27
5	......	......	30	56	91	238	210	101	42	42	42	32
6	......	......	30	56	85	201	192	94	42	42	42	32
7	......	......	30	56	91	210	201	82	42	42	42	32
8	......	......	30	56	91	238	210	76	47	42	42	37
9	......	......	30	67	85	281	227	70	52	42	42	37
10	......	......	30	91	85	368	210	76	52	42	37	32
11	......	......	30	79	85	437	201	76	52	42	37	32
12	......	......	30	61	97	437	192	76	52	42	37	27
13	......	......	30	73	110	422	168	94	52	52	37	27
14	......	......	30	85	184	452	152	88	58	47	37	22
15	......	......	34	79	325	467	137	82	52	47	47	22
16	......	......	35	61	445	516	137	76	52	42	37	22
17	......	......	35	61	416	482	130	82	52	42	27	23
18	......	......	35	61	416	482	130	76	47	42	42	23
19	......	......	35	56	394	482	144	76	47	37	37	23
20	......	......	35	40	329	482	152	70	47	37	42	23
21	......	......	40	50	210	437	137	64	42	37	37	25
22	......	......	40	73	192	437	137	58	42	42	32	25
23	......	......	40	130	238	381	130	52	47	42	27	25
24	......	......	40	130	228	342	137	52	47	42	27	23
25	......	......	40	144	210	342	246	52	42	42	32	23
26	......	......	45	160	192	329	246	52	47	42	32	23
27	......	......	45	144	160	316	227	47	47	42	37	20
28	......	......	45	97	168	304	136	47	42	42	32	20
29	......	......	45	79	176	270	129	52	42	42	22	20
30	......	......	45	73	184	259	129	47	42	37	27	20
31	......	......	45	......	201	......	144	47	......	47	......	20
Total	......	......	1099	2324	5798	10357	5586	2262	1406	1307	1085	798
Mean	......	......	35.5	77.5	187	345	180	73.0	46.9	42.2	36.2	25.7
Max.	......	......	45	160	445	516	270	108	58	52	47	37
Min.	......	......	30	40	67	168	129	47	42	37	22	20
Acre-ft.	......	......	2180	4610	11500	20500	11100	4490	2790	2590	2150	1580

Discharge of Saguache Creek Near Saguache for 1918.

Drainage Area, 595 Square Miles. Altitude, 7,800 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	20	25	30	56	56	134	80	62	62	48	43	......
2	20	25	30	56	62	126	74	62	68	48	43	......
3	20	25	30	51	74	142	74	74	68	54	43	......
4	20	25	30	51	86	150	86	74	80	48	43	......
5	20	25	30	45	80	166	80	68	92	48	43	......
6	20	25	30	35	86	166	92	68	92	48	43	......
7	20	25	30	40	105	174	98	68	80	48	43	......
8	20	25	35	40	105	166	105	62	74	48	43	......
9	25	30	35	40	112	174	112	62	80	48	43	......
10	25	30	35	51	119	192	134	68	119	48	43	......
11	25	30	35	51	112	183	134	86	174	43	54	......
12	25	30	35	51	105	166	126	80	133	43	48	......
13	25	30	40	56	98	183	119	74	110	43	48	......
14	25	30	40	56	119	192	119	112	95	43	48	......
15	25	35	40	51	142	174	105	134	88	43	48	......
16	25	35	40	45	174	166	158	98	85	43	43	......
17	25	35	40	40	166	158	134	80	83	54	43	......
18	30	35	40	40	183	142	98	74	81	54	43	......
19	30	35	40	40	174	150	86	62	79	54	45	......
20	30	35	45	40	183	142	86	62	66	54	50	......
21	30	35	45	40	174	142	98	68	64	59	50	......
22	30	35	40	45	166	174	92	68	57	54	50	......
23	30	35	45	45	174	183	92	74	55	48	50	......
24	30	35	45	45	201	178	98	68	54	48	50	......
25	30	35	51	45	201	142	92	62	54	43	50	......
26	30	30	51	51	192	142	86	62	54	43	45	......
27	30	30	51	51	174	119	80	62	54	43	45	......
28	30	30	51	51	166	105	74	62	54	43	45	......
29	30	......	45	51	158	92	68	68	48	43	45	......
30	30	......	51	51	150	86	68	68	48	43	43	......
31	30	......	51	......	150	......	68	62	......	43	......	......
Total	805	855	1236	1410	4247	4609	3016	2254	2351	1470	1378	......
Mean	26.0	30.5	39.9	47.0	137	154	97.3	72.7	78.4	47.4	45.8	......
Max.	30	35	51	56	201	192	158	134	174	59	54	......
Min.	20	25	30	35	56	86	68	62	48	43	43	......
Acre-ft.	1600	1690	2450	2800	8420	9160	5980	4470	4670	2910	2730	......

Unless otherwise noted, all discharges are in cubic feet per second.
Discharge estimated January 1st to March 21st.

Discharge of Alamosa River above Terrace Reservoir for 1917.

Drainage Area, 102 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	22	18	35	131	341	917	190	50	35	12	......
2	......	22	18	36	147	367	873	190	50	35	12	......
3	......	22	18	22	165	490	789	176	50	35	12	......
4	......	22	18	22	183	596	709	162	50	28	12	......
5	......	22	18	26	160	633	596	176	42	28	12	......
6	......	22	16	48	137	596	560	190	42	28	12	......
7	......	22	16	62	115	749	633	190	42	28	12	......
8	......	20	16	69	100	831	671	162	50	28	12	......
9	......	20	16	59	85	1050	596	149	50	22	12	......
10	......	20	16	52	85	1140	525	136	50	22	12	......
11	......	20	17	42	85	1100	490	136	57	22	12	......
12	......	20	17	50	85	1190	490	136	57	17	12	......
13	......	18	17	58	115	1280	458	136	83	17	12	......
14	......	18	18	80	131	1240	425	124	83	17	12	......
15	......	18	14	105	458	1280	396	102	57	22	12	......
16	......	18	14	82	560	......	367	124	50	22	12	......
17	......	18	25	75	596	......	367	136	50	22	12	......
18	......	18	22	54	633	......	367	124	50	17	12	......
19	......	18	20	47	633	......	367	102	42	12	12	......
20	......	18	16	50	490	......	367	92	35	12	12	......
21	......	18	20	57	425	......	396	83	35	17	12	......
22	......	18	19	81	458	......	367	74	35	17	12	......
23	......	18	17	137	458	......	396	74	57	17	12	......
24	......	20	18	183	367	......	291	74	57	12	12	......
25	......	20	18	245	341	......	291	66	50	12	12	......
26	......	20	18	291	291	......	425	66	42	12	12	......
27	......	20	18	245	267	......	267	66	35	12	17	......
28	......	20	19	155	367	......	255	74	35	12	17	......
29	......	......	35	131	458	......	245	66	35	17	17	......
30	......	......	47	100	490	......	245	57	35	22	17	......
31	......	......	47	......	425	......	206	50	......	22	......	......
Total	......	552	626	2690	9441	12883	14347	3683	1456	641	380	......
Mean	......	19.7	20.2	89.7	305	859	463	119	48.5	20.7	12.7	......
Max	......	22	47	291	633	......	917	190	83	35	17	......
Min	......	18	14	22	85	......	206	50	35	12	12	......
Acre-ft.	......	1090	1240	5340	18800	25600	28500	7320	2890	1270	756	......

Discharge of Alamosa River above Terrace Reservoir for 1918.

Drainage Area, 120 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	30	38	133	269	155	45	......	......	......	......
2	......	......	30	40	147	268	165	35	......	......	......	......
3	......	......	30	40	128	375	133	113	......	......	......	......
4	......	......	30	40	152	323	225	120	......	......	......	......
5	......	......	30	40	157	482	222	40	......	......	......	......
6	......	......	31	40	189	512	312	88	......	......	......	......
7	......	......	31	42	232	536	251	75	......	......	......	......
8	......	......	31	42	212	467	194	58	......	......	......	......
9	......	......	31	42	200	460	267	60	......	......	......	......
10	......	......	31	42	238	532	223	60	......	......	......	......
11	......	......	32	42	200	573	216	60	......	......	......	......
12	......	......	32	42	157	580	208	54	......	......	......	......
13	......	......	32	44	162	585	239	68	......	......	......	......
14	......	......	32	44	251	568	193	205	......	......	......	......
15	......	......	32	44	312	565	269	104	......	......	......	......
16	......	......	34	44	404	525	188	106	......	......	......	......
17	......	......	34	44	354	490	172	67	......	......	......	......
18	......	......	34	45	415	415	138	70	......	......	......	......
19	......	......	34	47	390	418	142	61	......	......	......	......
20	......	......	34	44	440	357	195	53	......	......	......	......
21	......	......	34	42	348	340	92	53	......	......	......	......
22	......	......	34	47	334	508	137	50	......	......	......	......
23	......	......	36	50	433	396	122	48	......	......	......	......
24	......	......	36	77	532	314	112	48	......	......	......	......
25	......	......	36	85	426	288	138	45	......	......	......	......
26	......	......	36	97	474	316	86	45	......	......	......	......
27	......	......	38	128	422	228	86	45	......	......	......	......
28	......	......	38	114	436	215	67	42	......	......	......	......
29	......	......	38	108	455	209	80	42	......	......	......	......
30	......	......	38	114	422	164	62	40	......	......	......	......
31	......	......	38	......	302	......	55	40	......	......	......	......
Total	......	......	1037	1708	9457	12278	5144	2040	......	......	......	......
Mean	......	......	33.5	56.9	306	409	166	65.8	......	......	......	......
Max	......	......	38	128	532	585	312	205	......	......	......	......
Min	......	......	30	38	128	164	55	35	......	......	......	......
Acre-ft.	......	......	2060	3890	18800	24300	10200	4050	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

ALAMOSA RIVER BELOW TERRACE RESERVOIR

Location.—One-fourth miles below Terrace Dam in Sec. 23, T. 36 N., R. 6 E., of New Mexico meridian.

Records Available.—April 18, 1909, to December 10, 1915; May 19, 1914, to August 22, 1918.

Gage.—Vertical staff gage bolted to left cliff at station. Gage location has been changed several times since station was established. Bristol gage installed May 7, 1915, referred to staff gage.

Channel.—Shifting during high water.

Discharge Measurements.—Made from cable at high stages and by wading at low stages.

Winter Flow.—Ice causes backwater effect and station is discontinued during the winter months.

Diversions.—There are no decreed diversions above this station.

Accuracy.—Although channel shifts somewhat, enough measurements have been made to make the estimates of discharge reliable.

Co-operation.—Station maintained in co-operation with the Terrace Irrigation District.

LA JARA CREEK NEAR CAPULIN

Location.—In Sec. 29, T. 34 N., R. 7 E., 13 miles above Capulin.

Records Available.—April, 1916, to November 30, 1917.

Drainage Area.—73 square miles.

Gage.—Bristol automatic.

Channel.—Fairly permanent.

Discharge Measurements.—By wading 25 to 40 feet below gage, except at extreme high water when measurements are made from highway bridge, 1½ miles below. Two small ditches of not to exceed 6 cubic feet per second capacity divert water between gage and bridge.

Diversions.—Station is above all decreed ditches.

Regulation.—Flow is regulated to some extent by the La Jara reservoir.

Co-operation.—Station maintained in co-operation with the Terrace Irrigation District.

Discharge of Alamosa River below Terrace Reservoir for 1917.

Drainage Area, 120 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	22	12	3	58	368	1020	334	51	38	12	22
2	......	22	12	22	66	368	1020	302	51	44	12	22
3	......	22	12	8	66	368	908	286	44	44	12	22
4	......	22	12	8	66	422	758	286	38	32	12	......
5	......	22	12	12	74	422	716	286	44	32	12	......
6	......	22	12	12	82	478	737	286	44	32	12	......
7	......	22	12	12	82	497	676	286	44	32	12	......
8	......	20	12	17	82	536	636	286	44	32	12	......
9	......	20	12	12	44	676	636	254	51	27	12	......
10	......	20	12	12	44	1070	656	238	51	27	12	......
11	......	20	12	12	44	1070	676	206	51	22	12	......
12	......	20	12	12	51	1040	676	192	51	22	12	......
13	......	18	12	12	51	1180	676	165	51	22	12	......
14	......	18	12	12	74	1260	576	152	51	22	12	......
15	......	18	8	12	82	1380	556	140	58	22	12	......
16	......	18	8	12	82	1450	516	140	51	22	12	......
17	......	18	17	22	82	1450	497	140	51	22	12	......
18	......	18	17	22	82	1450	478	128	51	17	12	......
19	......	12	8	22	90	1400	478	128	51	17	12	......
20	......	12	2	27	90	1400	478	128	44	17	12	......
21	......	12	4	27	90	1380	478	118	44	17	12	......
22	......	12	4	27	90	1260	478	118	44	17	12	......
23	......	12	4	27	90	1140	478	108	44	12	12	......
24	......	12	4	27	118	1140	459	108	44	12	12	......
25	......	12	4	27	165	1140	440	99	44	12	12	......
26	......	12	4	38	206	1070	422	99	44	12	12	......
27	......	12	4	38	192	1020	422	90	44	12	17	......
28	......	12	4	38	222	999	422	68	44	12	17	......
29	......	......	8	44	238	953	422	58	44	17	17	......
30	22	......	6	44	270	908	422	51	38	22	17	......
31	......	......	3	......	286	......	368	51	......	22	......	......
Total	......	482	277	620	3359	29295	18181	5329	1406	712	380	......
Mean	......	17.2	8.93	20.7	108	976	586	172	46.9	23.0	12.7	......
Max	......	22	17	44	286	1450	1020	334	58	44	17	......
Min	......	12	2	3	44	368	368	51	38	12	12	......
Acre-ft.	......	955	549	1230	6640	58100	36000	10600	2790	1410	756	......

Discharge of Alamosa River below Terrace Reservoir for 1918.

Drainage Area, 120 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	30	38	133	276	165	160	......	......	......	......
2	......	......	30	40	147	276	165	157	......	......	......	......
3	......	......	30	40	128	382	133	155	......	......	......	......
4	......	......	30	40	152	331	225	130	......	......	......	......
5	......	......	30	40	157	489	212	103	......	......	......	......
6	......	......	31	40	189	520	108	88	......	......	......	......
7	......	......	31	42	232	544	79	74	......	......	......	......
8	......	......	31	42	212	474	145	61	......	......	......	......
9	......	......	31	42	200	467	219	60	......	......	......	......
10	......	......	31	42	238	540	206	61	......	......	......	......
11	......	......	32	42	200	580	216	52	......	......	......	......
12	......	......	32	42	157	588	216	52	......	......	......	......
13	......	......	32	44	162	592	212	48	......	......	......	......
14	......	......	32	44	251	576	209	95	......	......	......	......
15	......	......	32	44	312	572	209	114	......	......	......	......
16	......	......	34	44	404	532	103	105	......	......	......	......
17	......	......	34	44	354	497	112	80	......	......	......	......
18	......	......	34	45	415	422	108	80	......	......	......	......
19	......	......	34	47	390	426	108	71	......	......	......	......
20	......	......	34	44	440	364	187	79	......	......	......	......
21	......	......	34	42	348	348	80	85	......	......	......	......
22	......	......	34	47	334	516	130	87	......	......	......	......
23	......	......	36	50	433	404	133	......	......	......	......	......
24	......	......	36	77	532	321	135	......	......	......	......	......
25	......	......	36	85	426	296	138	......	......	......	......	......
26	......	......	36	97	474	296	173	......	......	......	......	......
27	......	......	38	128	422	281	162	......	......	......	......	......
28	......	......	38	114	436	248	97	......	......	......	......	......
29	......	......	38	108	455	212	155	......	......	......	......	......
30	......	......	38	114	422	173	157	......	......	......	......	......
31	......	......	38	......	302	......	160	......	......	......	......	......
Total	......	......	1037	1708	9457	12543	4807	1997	......	......	......	......
Mean	......	......	33.5	56.9	306	418	155	90.8	......	......	......	......
Max	......	......	38	128	474	592	225	160	......	......	......	......
Min	......	......	30	38	128	173	79	48	......	......	......	......
Acre-ft.	......	......	2060	3390	18800	24900	9530	3960	......	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.
Discharge estimated from March 1st to April 17th.

Discharge of La Jara Creek near Capulin for 1917.
Drainage Area, 120 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	47	47	68	47	18	13	13	8	......
2	......	......	......	47	62	68	31	18	13	13	8	......
3	......	......	......	47	68	81	31	16	13	13	8	......
4	......	......	......	47	68	81	31	16	13	13	8	......
5	......	......	......	52	62	68	31	16	18	13	8	......
6	......	......	......	52	43	57	24	18	28	13	10	......
7	......	......	......	52	47	62	24	21	28	13	13	......
8	......	......	......	57	43	62	24	21	28	13	13	......
9	......	......	......	57	39	57	28	21	31	13	13	......
10	......	......	......	57	39	57	31	21	31	21	13	......
11	......	......	......	62	43	52	31	24	31	24	13	......
12	......	......	......	57	57	47	28	24	31	28	13	......
13	......	......	......	57	88	81	24	21	31	28	13	......
14	......	......	......	47	143	47	24	21	31	28	13	......
15	......	......	......	39	176	39	24	18	28	28	13	......
16	......	......	......	31	202	35	24	21	21	28	13	......
17	......	......	......	39	202	31	24	18	16	28	16	......
18	......	......	......	47	176	39	24	18	13	24	18	......
19	......	......	......	57	165	52	35	16	13	24	18	......
20	......	......	......	68	122	47	28	16	13	24	18	......
21	......	......	......	81	113	47	31	16	13	24	18	......
22	......	......	......	104	122	43	43	16	13	24	18	......
23	......	......	......	104	122	39	43	16	13	24	18	......
24	......	......	......	122	104	39	39	18	13	16	13	......
25	......	......	......	132	104	39	35	18	13	13	13	......
26	......	......	......	143	68	35	24	18	13	13	13	......
27	......	......	......	96	62	35	21	18	13	13	13	......
28	......	......	......	57	74	47	21	16	13	10	13	......
29	......	......	......	35	88	52	18	16	13	10	10	......
30	......	......	......	31	88	52	18	13	13	10	10	......
31	......	......	......	......	81	......	18	13	......	8	......	......
Total	......	......	......	1924	2918	1559	879	561	574	567	389	......
Mean	......	......	......	64.1	94.1	52.0	28.4	18.1	19.1	18.3	13.0	......
Max	......	......	......	143	202	81	47	24	31	28	18	......
Min	......	......	......	31	39	35	18	13	13	8	8	......
Acre-ft.	......	......	......	3810	5790	3090	1750	1110	1140	1130	774	......

Unless otherwise noted, all discharges are in cubic feet per second.

CONEJOS RIVER NEAR MOGOTE

Location.—At highway bridge about 5 miles above Mogote. From September 1, 1899, to March 31, 1900, and from April 17, 1903, to October 31, 1905, a station was maintained about 4 miles above Mogote. From March 21, 1907, to October 5, 1911, a station was maintained at Jacob's Ranch, 8 miles above Mogote.

Records Available.—January 1, 1912, to November 30, 1918.

Drainage Area.—282 square miles.

Gage.—An automatic recording gage.

Channel.—Shifts some at left side.

Discharge Measurements.—Made from bridge at high stages and by wading 75 feet to 150 feet below at low stages.

Winter Flow.—Ice causes backwater during the winter months.

Diversions.—There are court decrees for diversions of 3,476 second-feet from Conejos River, all but 66 second-feet being diverted below the present station.

Reservoirs.—No reservoirs have been constructed on the Conejos above this station.

LOS PINOS CREEK NEAR ORTIZ, COLO.

Location.—At a small semi-circular flume supported by cables, 2½ miles above Ortiz, Colorado.

Records Available.—January 1, 1914, to November 30, 1918.

Drainage Area.—167 square miles.

Gage.—Bristol automatic.

Channel.—Slightly shifting.

Discharge Measurements.—Made by wading, except during high water, when they are made from flume.

Diversions.—One small ditch diverts water above the station in Colorado.

Discharge of Conejos River near Mogote for 1917.

Drainage Area, 282 Square Miles. Altitude, 8,300 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	190	450	965	2540	465	110	56	44	44
2	......	......	......	205	450	1060	2360	405	100	56	44	44
3	......	......	......	180	400	1280	2280	375	100	56	44	44
4	......	......	......	150	400	1520	1950	348	90	56	44	44
5	......	......	......	125	350	1460	1790	348	90	56	44	44
6	......	......	......	125	350	1340	1790	348	80	56	44	40
7	......	......	......	140	315	1520	1710	320	80	56	44	40
8	......	......	......	200	315	1660	1870	295	90	56	44	40
9	......	......	......	200	290	2200	1790	295	90	56	44	35
10	......	......	......	260	265	2540	1470	270	80	56	44	35
11	......	......	......	320	265	2360	1250	295	80	50	44	35
12	......	......	......	390	290	2540	1180	320	110	50	44	35
13	......	......	......	460	370	2630	1250	348	100	50	44	35
14	......	......	......	475	610	2630	1120	320	110	50	44	30
15	......	......	......	490	1060	2720	1120	270	110	50	47	30
16	......	......	......	500	1280	2820	1060	248	90	50	47	30
17	......	......	......	420	1340	2820	945	248	80	50	44	30
18	......	......	......	340	1340	2630	890	248	90	50	44	25
19	......	......	......	260	1280	2720	945	225	90	47	44	25
20	......	......	......	180	1170	2720	1000	185	80	47	44	25
21	......	......	......	160	1060	2820	945	185	80	47	44	23
22	......	......	......	150	1120	2820	890	150	80	47	44	23
23	......	......	......	150	1170	2920	785	150	80	47	44	23
24	......	......	......	260	1060	2820	735	150	120	47	44	25
25	......	......	......	460	1020	2820	835	150	110	47	44	25
26	......	......	......	640	775	2720	945	150	90	44	44	25
27	......	......	......	640	690	2720	735	135	80	44	44	23
28	......	......	......	690	732	2630	605	135	80	44	44	23
29	......	......	......	560	965	2540	565	135	71	44	44	20
30	......	......	......	450	1060	2540	530	120	62	44	44	20
31	......	......	......	......	1120	......	495	110	......	44	......	20
Total	......	......	......	9770	23362	69485	38375	7746	2703	1553	1326	960
Mean	......	......	......	326	754	2320	1240	250	90.1	50.1	44.2	31
Max	......	......	......	690	1340	2920	2540	465	120	56	47	44
Min	......	......	......	125	265	965	495	110	62	44	44	20
Acre-ft.	......	......	......	19400	46400	138000	76200	15400	5360	3080	2630	1910

Discharge of Conejos River near Mogote for 1918.

Drainage Area, 282 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	20	20	60	136	476	1020	628	187	99	62	62	......
2	20	20	60	136	512	912	548	168	99	62	62	......
3	20	20	65	136	512	1140	476	187	99	62	62	......
4	20	20	65	136	628	1140	628	187	123	62	62	......
5	20	20	65	136	628	1550	716	187	168	62	62	......
6	20	25	70	136	716	1780	812	187	136	62	62	......
7	20	25	70	136	812	1850	812	187	123	62	54	......
8	20	25	75	152	763	1620	672	168	110	62	54	......
9	20	25	75	152	763	1400	672	152	110	62	54	......
10	20	25	80	228	763	1850	672	152	168	62	54	......
11	23	25	80	228	628	2100	672	136	300	70	70	......
12	23	30	85	250	548	2180	628	136	228	70	62	......
13	23	30	85	250	548	2180	588	136	137	62	62	......
14	23	30	90	275	763	2010	512	228	168	62	62	......
15	23	30	88	228	966	2180	548	412	168	62	62	......
16	25	35	88	206	1140	1930	588	228	136	62	54	......
17	25	35	79	187	1080	1930	548	206	110	62	54	......
18	25	35	79	168	1200	1700	444	187	110	62	54	......
19	25	40	79	152	1140	1620	444	187	99	70	62	......
20	25	40	70	136	1200	1400	444	152	88	79	54	......
21	25	40	70	123	1020	1330	383	136	88	79	54	......
22	25	40	70	136	966	1550	383	136	88	79	54	......
23	25	45	62	168	1140	1400	354	123	88	70	54	......
24	25	45	70	250	1330	1400	300	123	79	70	54	......
25	25	50	79	300	1330	1260	354	110	79	70	54	......
26	23	50	88	354	1400	1140	275	110	70	70	50	......
27	23	55	99	412	1330	1020	228	110	70	70	50	......
28	23	55	99	383	1330	912	228	99	70	70	50	......
29	23	......	88	383	1400	812	228	99	70	70	50	......
30	23	......	99	444	1260	716	206	88	62	62	50	......
31	23	......	123	......	1140	......	187	88	......	62	......	......
Total	703	935	2455	6517	29432	45032	15178	4992	3593	2053	1704	......
Mean	22.7	33.4	79.2	217	949	1500	490	161	120	66.2	56.8	......
Max	25	55	123	444	1400	2180	812	412	300	79	62	......
Min	20	20	60	123	476	716	187	88	62	62	50	......
Acre-ft.	1400	1850	4870	12900	58400	89300	30100	9900	7140	4070	3380	......

Unless otherwise noted, all discharges are in cubic feet per second.
Discharge estimated January 1st to March 15th.

Discharge of Los Pinos Creek near Ortiz for 1917.

Drainage Area, 167 Square Miles. Altitude, 8,100 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	190	515	465	49	19	16	13	......
2	......	......	......	......	206	587	433	44	19	16	16	......
3	......	......	......	......	215	788	403	40	16	16	13	......
4	......	......	......	......	215	898	373	40	16	13	13	......
5	......	......	......	......	230	854	330	40	16	13	13	......
6	......	......	......	......	217	788	330	40	16	13	13	......
7	......	......	......	......	206	921	305	35	19	13	13	......
8	......	......	......	......	195	1010	345	31	19	13	16	......
9	......	......	......	......	175	1110	330	27	23	13	16	......
10	......	......	......	......	165	1160	245	27	27	13	10	......
11	......	......	......	......	185	1010	217	31	31	13	13	......
12	......	......	......	......	206	1010	175	40	23	13	13	......
13	......	......	......	......	304	967	185	49	23	13	13	......
14	......	......	......	......	606	921	175	44	23	13	16	......
15	......	......	......	......	1040	898	155	40	19	13	16	......
16	......	......	......	......	1240	854	165	35	19	13	13	......
17	......	......	......	......	1300	788	137	44	19	13	10	......
18	......	......	......	......	1270	745	146	44	19	13	13	......
19	......	......	......	......	1040	704	146	35	19	10	16	......
20	......	......	......	......	704	704	120	31	16	10	16	......
21	......	......	......	......	606	704	105	23	19	10	16	......
22	......	......	......	......	684	664	91	23	19	10	16	......
23	......	......	......	......	745	644	84	19	19	10	13	......
24	......	......	......	......	704	606	91	23	31	13	13	......
25	......	......	......	......	625	606	120	23	23	13	13	......
26	......	......	......	......	433	587	84	23	19	13	10	......
27	......	......	......	......	345	532	77	19	19	13	10	......
28	......	......	......	......	418	515	65	19	16	13	10	......
29	......	......	......	......	568	482	54	23	16	10	10	......
30	......	......	......	......	664	482	60	19	16	8	10	......
31	......	......	......	......	684	......	54	19	......	10	......	......
Total	......	......	......	......	16385	23054	6065	999	598	386	396	......
Mean	......	......	......	......	529	768	196	32.2	19.9	12.5	13.2	......
Max	......	......	......	......	1300	1160	465	49	31	16	16	......
Min	......	......	......	......	190	482	54	19	16	8	10	......
Acre-ft.	......	......	......	......	32500	45700	12100	1980	1180	769	786	......

Discharge of Los Pinos near Ortiz for 1918.

Drainage Area, 167 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	20	45	502	415	80	27	23	12	20	......
2	......	......	20	50	539	352	68	23	23	12	20	......
3	......	......	20	50	577	399	94	27	20	12	20	......
4	......	......	20	45	577	383	141	27	31	12	23	......
5	......	......	20	45	558	431	160	27	27	12	23	......
6	......	......	20	50	674	484	204	27	35	12	23	......
7	......	......	25	62	694	484	160	27	27	12	23	......
8	......	......	25	74	694	484	116	23	20	12	23	......
9	......	......	25	87	694	399	141	23	23	14	23	......
10	......	......	25	132	654	431	94	23	23	17	23	......
11	......	......	25	132	484	431	94	20	27	20	30	......
12	......	......	25	150	415	431	94	20	27	17	23	......
13	......	......	30	160	448	431	87	23	23	17	23	......
14	......	......	30	181	577	399	80	35	20	14	23	......
15	......	......	30	141	714	367	80	35	17	14	23	......
16	......	......	23	124	674	337	116	27	17	14	20	......
17	......	......	23	108	654	308	80	27	14	14	20	......
18	......	......	23	101	634	294	68	23	14	14	20	......
19	......	......	23	94	577	322	68	20	14	20	20	......
20	......	......	23	87	558	280	74	20	12	23	20	......
21	......	......	23	87	520	266	62	23	12	27	20	......
22	......	......	23	101	502	266	68	23	12	27	20	......
23	......	......	20	141	539	240	62	20	12	20	20	......
24	......	......	23	204	577	253	50	20	12	20	20	......
25	......	......	23	253	539	216	45	20	12	20	20	......
26	......	......	23	337	502	170	40	17	12	20	15	......
27	......	......	27	383	466	141	35	17	12	20	15	......
28	......	......	31	367	466	124	31	17	12	20	15	......
29	......	......	27	383	466	108	31	20	12	17	15	......
30	......	......	27	415	431	94	31	20	12	17	15	......
31	......	......	35	......	415	......	27	20	......	17	......	......
Total	......	......	757	4589	17321	9740	2581	721	557	519	618	......
Mean	......	......	24.4	153	559	325	83.3	23.3	18.6	16.7	20.6	......
Max	......	......	35	415	714	484	204	35	35	27	30	......
Min	......	......	20	45	415	94	27	17	12	12	15	......
Acre-ft.	......	......	1500	9100	34400	19300	5120	1430	1110	1030	1230	......

Unless otherwise noted, all discharges are in cubic feet per second.
Discharge estimated March 1st to 15th.

SAN JUAN DRAINAGE

SAN JUAN RIVER AT ARBOLES

Location.—At Arboles, about one-fourth mile above the mouth of Piedra River, near the center of T. 33 N., R. 5 W.

Records Available.—From 1895 to 1899, and August 21, 1910, to December 31, 1917.

Drainage Area.—1,394 square miles.

Gage.—Chain gage.

Channel.—Likely to shift at high stages.

Discharge Measurements.—Made from car and cable or by wading.

Winter Conditions.—Ice generally interferes from December to March.

Diversions.—There are court decrees for the diversion of 23 second-feet between Arboles and the station at Pagosa Springs, Colo., and 61 second-feet from intervening tributaries.

Floods.—The highest gage height recorded since the station was established was 17 feet on October 1, 1911, when the discharge was 40,000 second-feet.

Co-operation.—Records furnished by the State Engineer of New Mexico.

NAVAJO RIVER AT EDITH

Location.—Six miles northeast of Lumberton, New Mexico, at the highway bridge on the Lumberton-Edith road, one-eighth mile east of Edith, a short distance north of the New Mexico-Colorado state line, near the southwest corner of T. 33 N., R. 1 E., about 5 miles downstream from the confluence of Navajo and Little Navajo rivers. A small tributary enters from the north about one-fourth mile below the station.

Records Available.—September 21, 1912, to December 31, 1917.

Drainage Area.—Not known.

Gage.—Vertical staff.

Channel.—Liable to small shifts.

Discharge Measurements.—Made from the bridge or by wading.

Winter Conditions.—Ice forms during the winter months.

Diversions.—Water is diverted for irrigation above the station.

Co-operation.—Records furnished by State Engineer of New Mexico.

Discharge of San Juan River at Arboles for 1917.
Drainage Area, 1,394 Square Miles. Altitude, 6,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	263	339	276	785	1980	2030	4470	1000	225	195	115	89
2	264	339	272	640	1810	2060	3560	775	220	190	118	100
3	266	339	268	565	1700	2550	3900	740	230	180	115	95
4	268	340	263	470	1600	3510	3030	645	205	165	118	105
5	269	340	259	1260	1620	3070	2620	665	170	165	118	100
6	271	340	255	1580	1600	3530	2720	560	165	170	105	100
7	274	340	250	1540	1450	2930	2800	525	165	155	89	65
8	277	340	246	1500	1380	3480	3430	425	158	140	95	71
9	280	340	377	1460	1700	3400	2970	375	175	145	118	49
10	283	340	508	1390	1900	4150	2820	375	170	140	105	39
11	286	341	639	1370	1420	4420	2650	400	185	145	100	65
12	289	341	770	1420	1900	4500	2750	370	340	140	100	95
13	292	341	770	2220	1780	4660	2550	525	315	140	89	65
14	295	341	770	2220	2180	5200	2050	475	330	120	95	61
15	298	336	770	2140	3280	4980	2350	425	280	118	95	61
16	301	333	840	2530	4120	5020	2570	475	230	120	95	65
17	305	328	875	1480	4020	5050	1860	375	230	125	95	30
18	309	324	965	2110	3780	5220	1540	375	230	135	95	25
19	313	320	1050	1830	3540	4660	1460	375	225	120	100	22
20	317	316	1110	1740	2600	4850	1930	350	275	118	89	30
21	322	311	1200	1950	2590	4530	1490	340	205	130	80	39
22	326	307	1200	1960	2530	4630	1290	340	205	118	80	49
23	330	303	1050	2500	2540	4490	1290	280	185	95	105	39
24	334	299	990	2750	2070	4530	1200	265	290	118	105	61
25	338	294	990	3140	1910	4540	1180	205	330	125	105	55
26	338	289	735	3230	1970	4540	1210	280	220	120	100	65
27	338	285	710	3010	1870	4380	1490	275	240	105	89	105
28	338	280	710	2820	1770	4600	1020	220	220	95	95	118
29	339	......	875	2020	1740	4490	1020	220	195	100	118	89
30	339	......	1500	1860	1890	4430	1060	225	215	100	61	89
31	339	......	1390	......	1950	......	940	215	......	115	......	95
Total	9401	9086	22883	55490	68190	124430	67220	13095	6828	4147	2987	2136
Mean	303	324	738	1850	2200	4150	2170	422	228	134	99.6	68.9
Max.	339	341	1500	3230	4120	5220	4470	1000	340	195	118	118
Min.	263	280	246	470	1380	2030	940	205	158	95	61	22
Acre-ft.	18600	18000	45400	110000	135000	247000	133000	26000	13500	8220	5920	4240

Discharge of San Juan River at Arboles for 1918.
Drainage Area, 1,394 Square Miles. Altitude, 6,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	49	92	63	1040	1140	1330	750	340	215	128	120	90
2	49	93	59	835	1140	1680	525	325	220	128	120	89
3	71	94	54	700	1180	1900	770	280	170	128	120	88
4	61	96	50	720	1510	1880	825	385	400	120	120	86
5	55	97	50	645	1420	2270	905	300	550	100	120	84
6	30	99	280	555	1560	2550	1680	300	480	90	155	83
7	55	100	890	670	1600	2710	1560	298	320	90	185	81
8	56	102	1350	595	1400	2630	1160	260	240	90	180	80
9	58	103	595	720	1380	2440	1200	270	345	100	180	79
10	59	105	930	1090	1520	2710	1300	260	320	130	178	77
11	61	106	975	1030	1270	2990	1530	250	1340	155	155	76
12	62	108	1530	1030	1040	3200	1330	225	1100	130	150	75
13	64	109	2580	985	1020	2880	1160	230	480	128	159	73
14	65	110	1090	1000	1400	2710	1220	1090	325	120	185	72
15	67	112	670	940	1540	2500	1280	1060	320	98	155	70
16	68	113	570	880	1950	2170	1340	525	300	76	155	69
17	70	115	555	620	1670	2110	1400	500	480	76	155	67
18	71	111	570	525	1820	1780	1460	400	400	90	155	66
19	72	106	630	490	1800	1780	1210	325	310	76	155	65
20	74	102	595	490	1770	1880	954	280	265	128	155	63
21	75	98	570	420	1550	2050	700	280	220	320	155	62
22	77	93	555	450	1460	2550	640	640	180	250	159	61
23	78	89	500	510	1700	1990	625	360	180	185	185	59
24	80	85	555	550	1830	2220	588	280	185	180	180	58
25	81	80	680	580	1830	1730	625	215	170	155	120	57
26	83	76	790	655	1930	1530	610	178	178	185	125	55
27	84	72	645	935	1830	1300	500	185	170	160	120	54
28	86	67	615	1040	1780	1020	460	180	155	150	120	52
29	87	......	615	1060	1830	855	415	185	145	125	120	51
30	89	......	645	1130	1720	750	415	178	128	120	90	50
31	90	......	700	......	1530	......	365	170	......	120	......	48
Total	2127	2733	20956	22890	48120	62095	29502	10754	10291	4131	4431	2140
Mean	68.6	97.6	676	763	1550	2070	952	347	333	133	148	69.3
Max.	90	115	2580	1130	1950	3200	1680	1090	1340	320	185	90
Min.	30	67	50	420	1020	750	365	170	128	76	90	48
Acre-ft.	4220	5420	41600	45400	95400	123000	58500	21300	20400	8190	8790	4240

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Navajo River at Edith for 1917.

Drainage Area, ... Square Miles. Altitude, 7,100 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	59	62	40	76	512	366	810	......	54	49	37	32
2	60	61	39	155	558	432	810	......	67	49	37	32
3	61	60	38	182	366	338	766	......	67	49	37	32
4	62	59	38	220	366	432	570	......	67	49	37	32
5	63	58	37	220	470	512	570	......	67	49	37	32
6	62	58	36	220	512	835	570	......	67	43	43	32
7	62	57	38	286	232	966	494	......	54	43	38	43
8	61	56	39	286	210	966	766	......	54	49	43	43
9	60	55	41	246	232	835	610	......	54	54	43	43
10	59	54	42	286	266	966	570	......	54	49	37	43
11	58	54	44	366	338	1100	570	......	54	49	32	43
12	58	53	45	660	338	1100	......	60	54	49	32	43
13	57	52	47	432	338	1160	......	43	54	49	32	43
14	58	51	48	338	714	1230	......	80	54	45	32	43
15	59	51	50	310	966	1360	......	80	54	49	32	43
16	59	50	52	232	966	1490	......	80	54	49	32	42
17	60	49	53	232	900	1490	......	80	54	49	32	42
18	61	48	55	232	900	1100	......	80	54	49	32	41
19	62	48	56	232	900	1030	......	80	54	45	32	40
20	63	47	58	200	714	835	......	80	54	49	32	40
21	64	46	60	210	606	835	......	80	54	43	32	39
22	64	45	61	470	512	900	......	80	57	43	32	38
23	65	44	63	558	512	966	......	80	57	43	32	37
24	66	44	64	558	512	966	......	73	54	43	32	37
25	67	43	66	660	512	900	......	60	54	43	32	36
26	66	42	67	660	432	900	......	54	57	43	32	35
27	65	41	69	606	366	900	......	54	60	43	32	35
28	65	41	70	512	432	900	......	54	54	40	32	34
29	64	......	72	286	470	835	......	54	54	40	32	33
30	63	......	73	432	512	835	......	54	49	40	32	32
31	62	......	74	......	558	......	......	54	......	37	......	32
Total	1915	1429	1635	10363	16222	27480	7106	1360	1695	1423	1029	1172
Mean....	61.8	51.0	52.7	345	523	916	646	68.0	56.5	45.9	34.3	37.8
Max.	67	72	74	660	966	1490	......	......	67	54	43	43
Min.......	57	41	36	76	210	338	......	......	49	37	32	32
Acre-ft.	3800	2830	3240	20500	32200	54500	14100	2700	3360	2820	2040	2320

Discharge of Navajo River at Edith for 1918.

Drainage Area, ... Square Miles. Altitude, 7,100 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	31	33	57	168	255	255	143	64	108	39	33	33
2	30	34	59	168	272	255	133	64	55	39	31	33
3	30	34	61	143	314	292	155	64	58	39	31	33
4	29	34	63	143	314	314	262	64	69	38	31	33
5	29	34	65	143	272	410	168	61	58	38	31	33
6	29	34	67	123	314	445	373	57	54	38	30	33
7	29	34	69	143	314	314	255	57	54	38	30	33
8	30	34	70	143	292	445	180	57	54	37	30	33
9	30	35	72	143	292	445	180	57	53	37	28	33
10	30	35	74	155	272	523	168	57	72	37	28	33
11	30	35	76	207	237	651	168	57	67	37	28	33
12	30	35	78	193	207	606	155	57	67	36	30	33
13	30	35	80	207	221	606	155	77	62	36	30	33
14	31	35	82	193	237	606	133	314	58	36	31	33
15	31	36	84	155	272	445	155	102	58	36	33	33
16	31	36	84	143	373	410	133	77	52	35	33	33
17	31	36	84	133	410	373	123	64	52	35	33	33
18	31	36	72	123	410	292	113	64	49	35	33	33
19	31	38	72	102	379	292	113	57	46	35	33	33
20	32	40	72	102	292	292	102	57	46	37	33	33
21	32	42	92	92	255	523	84	57	46	41	33	33
22	32	44	92	113	237	336	102	57	45	38	33	33
23	32	46	102	123	336	292	92	56	45	38	33	33
24	32	48	102	133	336	373	102	56	45	38	33	33
25	32	49	102	168	292	314	84	56	45	33	33	33
26	32	51	102	193	292	221	84	56	44	33	33	33
27	33	53	113	221	336	180	72	56	44	33	33	33
28	33	55	123	193	336	155	72	51	44	33	33	33
29	33	......	123	221	410	168	68	51	44	32	33	33
30	33	......	133	221	373	143	68	52	43	32	33	33
31	33	......	155	......	292	......	64	127	......	32	......	33
Total	962	1091	2680	4708	9444	10976	4259	2203	1637	1121	950	1023
Mean....	31.0	39.0	86.4	157	305	366	137	71.1	54.6	36.2	31.7	33.0
Max.	33	55	155	221	410	651	373	314	108	41	33	33
Min.......	29	33	57	92	207	143	64	51	43	32	28	33
Acre-ft.	1910	2160	5310	9340	18700	21800	8450	4370	3250	2220	1880	2030

Unless otherwise noted, all discharges are in cubic feet per second.
November 23rd to December 31st, ice effect.

PIEDRA RIVER AT ARBOLES

Location.—At the Denver & Rio Grande railroad bridge at Arboles, in Sec. 16, T. 33 N., R. 5 W. The Piedra empties into San Juan one-half mile below the station.

Records Available.—June 19, 1895, to September 30, 1899; August 21, 1910, to December 31, 1918.

Drainage Area.—650 square miles.

Gage.—Chain gage.

Channel.—Permanent except during high water.

Discharge Measurements.—Made from the railroad bridge or by wading.

Diversions.—There are a number of small diversions for irrigation above the station.

Co-operation.—Records furnished by the State Engineer of New Mexico.

LOS PINOS RIVER NEAR IGNACIO

Location.—At the highway bridge at the Southern Ute Indian Agency, near Sec. 8, T. 33 N., R. 7 W. The nearest tributary is a small stream entering from the west about 2 miles below the station.

Records Available.—April 22, 1899, to October 31, 1903; September 1, 1910, to November 30, 1912; March 10, 1913, to December 31, 1918.

Drainage Area.—450 square miles.

Gage.—Chain.

Channel.—Shifting.

Discharge Measurements.—Made from the bridge or by wading.

Winter Conditions.—The gage height and discharge relation may be affected by ice during winter months.

Diversions.—Irrigation is continuous from a point several miles above Bayfield, Colo., to the station.

Co-operation.—Records furnished by the State Engineer of New Mexico.

Discharge of Piedra River at Arboles, Colo., for 1917.
Drainage Area, 650 Square Miles. Altitude, 6,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	117	133	124	618	1420	1600	2240	263	91	132	75	77
2	118	133	123	560	1420	1560	1880	607	145	128	75	80
3	119	132	123	484	1680	1800	1950	433	115	122	77	65
4	120	132	123	405	1730	1780	1560	398	91	132	75	75
5	121	131	123	420	1550	1930	1380	355	91	122	68	60
6	122	131	122	640	1560	2070	1450	238	91	112	77	65
7	124	130	122	732	1530	2320	1560	212	94	110	77	60
8	126	130	122	940	1430	2350	1800	242	80	98	60	50
9	129	129	110	765	1430	2970	1530	238	112	94	75	36
10	131	129	99	678	1490	3040	1550	208	105	94	77	40
11	133	128	88	1340	2060	2770	1420	212	112	94	77	54
12	135	128	77	1250	2520	2970	1350	252	290	94	80	32
13	137	128	66	2010	2340	3110	1420	212	224	98	75	21
14	140	127	54	2060	2290	3420	1340	177	224	105	65	21
15	142	127	47	1720	2910	3150	1060	212	168	86	77	20
16	144	127	47	1490	3970	3030	1230	224	145	86	86	20
17	143	126	65	1250	3870	2760	1090	238	155	86	77	19
18	142	126	77	1780	3670	2770	1060	238	145	80	65	19
19	142	126	94	1400	3020	2910	890	195	132	91	47	18
20	141	126	122	1090	2500	2960	1020	177	132	77	58	18
21	140	125	155	1400	2430	2430	1190	180	132	80	68	18
22	139	135	192	1840	2340	2550	960	60	132	65	80	18
23	138	125	180	2550	2060	2550	765	122	112	80	80	17
24	138	125	234	2660	1880	2520	720	94	65	80	68	17
25	137	124	309	2720	1990	2490	678	80	112	94	80	17
26	136	124	370	3110	1820	2520	678	155	168	91	80	16
27	136	124	155	2680	1730	2520	830	145	155	86	91	16
28	135	124	238	2460	1680	2640	607	132	137	77	77	16
29	135	......	442	1760	1600	2520	618	132	145	65	77	16
30	134	......	678	1760	1680	2410	720	110	137	60	77	15
31	134	......	732	......	1600	......	650	98	......	75	......	15
Total	4128	3585	5613	44572	65200	76420	37196	6639	4037	2894	2221	1031
Mean....	133	128	181	1490	2100	2550	1200	217	135	93.4	74.0	33.2
Max.	144	135	732	3110	3970	3420	2240	607	290	132	91	80
Min.......	117	124	47	405	1420	1560	607	80	65	60	47	15
Acre-ft.	8190	7110	11100	88400	129000	152000	73800	13400	8020	5740	4400	2040

Discharge of Piedra River at Arboles for 1918.
Drainage Area, 650 Square Miles. Altitude, 6,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	15	35	94	515	540	640	237	156	120	120	90	89
2	14	36	94	453	540	640	215	135	120	110	90	88
3	14	37	94	434	580	1050	237	144	144	100	90	87
4	14	38	94	408	740	1050	160	128	275	90	90	86
5	13	38	94	365	870	1160	356	135	250	84	96	85
6	13	39	112	332	968	1120	338	123	215	80	96	85
7	13	40	265	347	992	1120	420	123	185	70	100	84
8	14	41	380	347	872	1010	338	123	156	70	100	83
9	15	42	210	415	800	922	407	110	172	84	100	82
10	16	43	193	560	916	1160	508	128	356	104	110	81
11	16	44	215	540	700	1200	250	123	762	104	104	80
12	17	45	695	547	580	1320	199	120	492	90	96	79
13	18	46	950	544	600	1120	165	120	381	90	76	78
14	19	46	493	508	780	1160	212	310	210	90	110	77
15	20	47	318	480	1020	1050	259	356	140	90	100	76
16	21	48	252	464	1200	840	306	228	135	80	96	75
17	22	49	318	420	1020	762	353	190	237	80	80	75
18	23	54	318	376	1100	668	400	156	223	80	96	74
19	24	59	380	340	1080	640	379	140	205	80	100	73
20	24	64	380	366	1060	606	359	140	180	90	104	72
21	25	69	375	396	918	700	338	140	165	150	104	71
22	26	74	365	405	840	1010	263	144	144	172	100	70
23	27	79	307	465	1050	912	263	160	140	123	100	69
24	28	84	408	448	1260	730	250	165	140	120	96	68
25	29	89	398	480	1090	640	263	140	156	123	100	67
26	30	94	375	562	1090	560	150	128	140	123	104	66
27	30	94	307	535	922	492	150	128	123	100	96	66
28	31	94	398	612	940	362	123	120	120	96	96	65
29	32	......	307	580	940	313	120	120	120	90	80	64
30	33	......	398	584	840	250	123	120	120	90	90	63
31	34	......	415	......	650	......	135	120	......	90	......	62
Total	670	1568	10002	13828	27498	25207	8276	4673	6326	3069	2884	2340
Mean....	21.6	56.0	323	461	887	840	267	151	211	99.0	96.1	75.5
Max.	34	94	950	612	1260	1320	508	356	762	172	110	89
Min.......	13	35	94	332	540	250	120	110	120	70	76	62
Acre-ft.	1330	3110	19800	27400	54500	50000	16400	9270	12500	6090	5720	4640

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Los Pinos River at Ignacio for 1917.
Drainage Area, 450 Square Miles. Altitude, 6,480 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	173	112	99	286	835	1010	2290	255	8.5	120	30	24
2	165	116	94	245	820	940	2180	240	8.0	118	29	23
3	156	121	88	220	775	1060	1930	200	7.0	118	28	35
4	147	125	83	202	815	1250	1800	188	8.0	118	21	52
5	138	130	78	235	868	1500	1600	155	5.5	110	16	46
6	130	134	72	295	775	1500	1510	170	5.0	102	19	38
7	121	139	67	340	685	1660	1630	152	5.2	104	26	42
8	121	144	61	392	730	1760	1680	140	6.5	100	26	47
9	121	148	56	660	735	2150	1510	122	6.0	92	28	66
10	121	152	58	520	730	2410	1310	106	6.5	98	29	82
11	121	157	61	465	845	2410	1240	96	8.0	84	30	97
12	121	162	63	470	800	2480	1240	102	74.0	68	28	70
13	122	166	66	710	820	2600	1140	165	58.0	55	28	70
14	122	171	68	745	915	2640	1070	145	72.0	48	20	84
15	122	175	87	710	1340	2830	1000	112	92.0	36	24	70
16	122	170	77	635	1740	2780	1020	100	62.0	38	26	67
17	122	164	80	565	1870	2820	915	96	52.0	33	32	66
18	119	159	80	735	1940	2750	745	96	50.0	35	23	70
19	115	153	83	530	1860	2860	755	84	42.0	38	30	68
20	112	148	92	525	1500	2490	735	70	35.0	32	29	67
21	109	142	91	590	1390	2500	665	66	31.0	35	36	60
22	106	137	112	765	1310	2250	630	70	26.0	32	35	54
23	102	132	93	955	1340	2500	540	42	128.0	32	26	62
24	99	126	106	1000	1320	2430	625	33	158.0	38	30	66
25	96	121	136	1130	1300	2340	765	16	160.0	34	34	59
26	92	116	170	1220	1140	2360	490	15	145.0	34	30	52
27	89	110	148	1170	970	2320	890	11	138.0	38	31	54
28	93	105	192	1030	1030	2210	575	11	126.0	29	21	55
29	98	......	350	940	1060	2210	420	10	126.0	33	21	51
30	103	......	460	820	1140	2250	500	9	116.0	29	18	54
31	107	......	405	......	1090	......	315	8	......	29	......	48
Total	3685	3935	3776	19105	34488	65270	33715	3085	1765.2	1910	804	1745
Mean	119	141	122	637	1110	2180	1090	99.5	58.8	61.6	26.8	58.0
Max.	173	175	460	1220	1940	2860	2290	255	160	120	36	97
Min.	89	105	56	202	685	940	315	8	5	29	16	23
Acre-ft.	7310	7800	7490	37900	68400	129000	66900	6120	3500	3790	1590	3570

Discharge of Los Pinos River at Ignacio for 1918.
Drainage Area, 450 Square Miles. Altitude, 6,480 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	52	69	67	246	342	378	77.0	6.4	11	19.0	46	47
2	64	67	75	249	366	478	55.0	6.0	17	12.0	38	48
3	58	65	69	237	334	1000	54.0	6.4	12	11.0	36	49
4	62	63	75	220	366	1010	178.0	7.8	28	9.5	35	50
5	59	61	85	201	500	1120	130.0	7.4	35	8.1	35	52
6	56	59	117	187	572	1040	243.0	8.3	22	7.4	43	53
7	54	57	165	223	657	1220	270.0	9.3	13	7.8	25	54
8	49	55	350	213	495	892	273.0	9.0	15	8.6	18	55
9	64	53	180	220	469	940	243.0	9.0	32	11.0	12	56
10	59	51	144	261	478	1150	374.0	16.0	748	9.5	18	57
11	39	49	155	299	374	1270	538.0	26.0	1580	10.0	21	58
12	62	47	320	309	292	1200	394.0	12.0	892	10.0	38	60
13	84	45	710	316	320	1090	374.0	10.0	550	9.7	36	61
14	51	43	270	306	528	1120	350.0	15.0	427	10.0	59	62
15	67	41	82	299	820	1010	327.0	230.0	350	10.0	59	63
16	78	39	122	286	1080	804	394.0	95.0	316	12.0	57	64
17	62	43	178	276	1040	602	320.0	52.0	267	12.0	50	65
18	67	47	192	255	1140	436	270.0	33.0	226	15.0	32	66
19	70	51	190	233	1090	382	125.0	15.0	195	12.0	33	68
20	72	55	187	220	1350	313	80.0	14.0	165	14.0	34	69
21	70	60	192	210	828	324	57.0	29.0	149	98.0	35	70
22	67	64	173	210	566	522	43.0	134.0	137	51.0	37	71
23	87	68	175	198	868	555	38.0	82.0	130	73.0	38	72
24	85	72	201	233	1150	444	23.0	35.0	112	67.0	39	73
25	83	76	201	261	1010	362	12.0	23.0	98	73.0	40	75
26	81	80	204	292	1010	283	9.5	15.0	85	57.0	41	76
27	79	71	230	309	876	226	8.7	15.0	69	51.0	42	77
28	77	71	226	302	900	182	8.5	13.0	61	46.0	44	78
29	75	......	192	309	908	149	8.5	12.0	48	42.0	45	79
30	73	......	213	313	635	110	8.0	12.0	36	46.0	46	80
31	71	......	258	......	452	......	7.2	12.0	......	40.0	......	81
Total	2077	1622	5998	7693	21816	20612	5292.4	969.6	6821	862.6	1126	1989
Mean	67.0	57.9	193	256	704	687	171	31.3	227	27.8	37.5	64.2
Max.	87	80	710	316	1350	1270	538	230	1580	98	59	81
Min.	39	39	67	187	292	110	7.2	6	11	7.4	12	47
Acre-ft.	4120	3220	11900	15300	43300	40900	10500	1920	13500	710	2230	3940

Unless otherwise noted, all discharges are in cubic feet per second.

ANIMAS RIVER AT DURANGO

Location.—At the footbridge at the foot of Fourteenth Street in Durango, near the power plant of the San Juan Water & Power Co. Junction Creek enters about three-fourths of a mile above, and Lightner Creek about the same distance below the station.

Records Available.—June 20, 1895, to December 31, 1905; January 1, 1910, to December 31, 1918.

Drainage Area.—694 square miles (from Hayden's Atlas).

Gage.—Vertical staff.

Channel.—Permanent.

Discharge Measurements.—Made from cable.

Winter Conditions.—Ice rarely forms.

Diversions.—Water is diverted for irrigation for about 15 miles above the station.

Floods.—The maximum observed gage height was 13.6 feet in October, 1911.

Co-operation.—Records furnished by the State Engineer of New Mexico.

FLORIDA RIVER NEAR DURANGO

Location.—At wagon bridge on the Upper Florida River about eight miles from Durango.

Records Available.—May 21, 1899, July 31, 1899; April 1, 1901, October 5, 1903; September 18, 1910, November 30, 1918.

Drainage Area.—Not known.

Gage.—Vertical staff. This gage has no relation to gage established September 18, 1910.

Channel.—Probably shifting.

Discharge Measurement.—Made from bridge or by wading.

Winter Conditions.—Ice forms during winter months.

Co-operation.—Maintained in co-operation with the State Engineer of New Mexico.

Discharge of Animas River at Durango for 1917.

Drainage Area, 694 Square Miles. Altitude, 6,550 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	290	330	290	570	1190	1790	6140	1390	425	432	281	184
2	300	330	290	570	1290	1860	5650	1250	455	445	281	162
3	320	330	290	570	1380	2040	4730	1090	455	445	287	162
4	330	305	290	570	1390	2510	4620	1000	445	432	287	162
5	305	305	290	455	1390	3530	4100	920	440	415	281	158
6	305	305	290	500	1290	3080	3180	875	425	400	275	158
7	330	305	290	570	1200	3900	4100	900	410	400	275	158
8	330	305	290	570	1090	4400	4000	830	445	400	262	158
9	330	305	290	570	1020	4960	3260	800	455	400	262	153
10	325	290	290	575	1000	5900	3530	800	460	400	262	153
11	320	290	270	700	990	5900	3530	780	475	400	256	153
12	305	290	270	750	1150	6140	3180	760	500	400	244	153
13	305	290	270	920	1410	6500	3180	870	500	400	232	149
14	328	290	270	1000	1980	7020	2840	840	480	400	220	149
15	330	290	270	1090	3000	7940	2510	858	500	400	214	144
16	330	290	260	920	3000	8460	2460	800	475	375	208	144
17	330	290	255	840	3900	8460	2390	775	455	355	208	140
18	330	290	255	840	3900	8200	2240	700	445	350	196	140
19	330	290	255	700	3900	8070	2100	720	410	350	202	140
20	330	270	255	700	2690	7150	2240	640	425	350	196	128
21	330	270	255	700	2170	7150	1980	630	400	350	190	110
22	320	270	255	875	2240	6900	1840	590	425	350	184	50
23	305	270	255	1250	2390	6900	1840	575	355	342	184	60
24	305	270	255	1710	2460	7020	1840	570	350	342	184	90
25	305	280	290	1980	2320	6900	2000	570	350	338	166	90
26	290	290	330	1790	1980	6770	1910	565	350	330	184	98
27	290	290	355	1790	1980	6390	2210	570	355	330	184	128
28	320	290	475	1440	1840	6900	1840	512	425	324	184	162
29	330	......	700	1250	1980	6500	1840	512	425	305	184	175
30	330	......	775	1090	2100	6140	1600	500	425	293	184	196
31	330	......	630	......	1980	......	1600	475	......	287	......	214
Total	9858	8220	10105	27855	61600	175380	90480	23667	12940	11540	6757	4421
Mean	318	294	326	928	1990	5850	2920	763	431	372	225	143
Max.	330	330	775	1980	3900	8460	6140	1390	500	445	287	214
Min.	290	270	255	455	990	1790	1600	475	350	287	166	50
Acre-ft.	19500	16300	20000	55200	122000	348000	179000	46900	25700	22900	13400	8770

Discharge of Animas River at Durango for 1918.

Drainage Area, 694 Square Miles. Altitude, 6,550 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	214	162	196	410	860	1520	1110	415	425	400	293	305
2	214	162	214	425	990	1700	1050	395	425	400	274	305
3	214	140	214	425	1160	2300	1030	395	490	400	274	305
4	214	140	214	425	1350	2630	1130	500	490	375	274	305
5	214	105	220	455	1460	2950	1160	685	480	375	274	305
6	196	105	244	455	1400	3210	1200	630	480	375	274	305
7	196	95	244	420	1350	3780	1230	600	480	375	274	305
8	196	85	244	450	1350	4050	1230	650	490	350	274	305
9	196	85	244	510	1230	4400	1350	715	600	350	274	305
10	214	60	244	600	1200	4350	1350	715	1160	350	274	293
11	214	55	293	600	1130	4300	1300	680	2800	350	274	293
12	214	85	350	560	1200	4190	1200	660	2250	350	274	298
13	214	95	400	560	1320	4150	1200	600	1500	350	274	274
14	208	105	355	560	1550	4150	1110	700	1350	350	274	274
15	208	140	350	520	1850	4150	1000	850	1200	350	274	274
16	208	140	330	510	2230	3580	950	720	910	350	274	274
17	208	140	330	510	2430	3000	930	660	755	350	274	274
18	202	162	305	510	2480	2590	860	610	710	350	274	270
19	196	162	305	510	2630	2480	770	550	670	350	274	265
20	196	140	305	510	2950	2410	730	500	615	355	274	261
21	196	140	305	520	2900	2430	700	615	570	400	274	256
22	196	184	305	520	2800	2480	640	710	540	375	274	252
23	184	184	305	520	2700	2200	624	635	490	350	274	247
24	184	184	305	520	2700	2130	570	615	480	330	274	243
25	184	149	305	550	2700	2030	550	555	455	330	299	238
26	175	110	320	680	2590	1820	520	540	455	330	305	234
27	175	140	330	790	2560	1550	495	515	443	330	293	229
28	175	175	342	790	2340	1300	460	490	425	305	280	225
29	162	......	375	790	2030	1200	450	480	425	305	274	220
30	162	......	390	790	1700	1110	435	455	425	305	298	216
31	162	......	410	......	1520	......	415	425	......	305	......	211
Total	6091	3629	9293	16395	58660	84140	27749	18265	22988	10920	8339	8361
Mean	196	130	300	546	1890	2800	895	589	766	352	278	270
Max.	214	184	410	790	2950	4400	1350	850	2800	400	305	305
Min.	162	55	196	410	860	1100	415	395	425	305	274	211
Acre-ft.	12100	7200	18400	32500	116000	167000	55000	36200	45600	21700	16500	16600

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Florida River at Durango for 1917.
Drainage Area, 136 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	244	1320	132	21	34	13	7
2	......	......	......	......	......	219	1190	121	21	44	13	7
3	......	......	......	......	......	267	1010	110	21	34	13	7
4	......	......	......	......	......	379	878	110	21	34	13	7
5	......	......	......	......	......	497	806	100	21	34	13	7
6	......	......	......	......	......	490	620	90	21	28	13	7
7	......	......	......	......	......	670	798	80	21	21	13	7
8	......	......	......	......	......	911	730	80	21	21	13	7
9	......	......	......	......	......	1090	593	70	21	21	13	7
10	......	......	......	......	......	1270	464	70	21	21	13	7
11	......	......	......	......	......	1320	460	80	34	21	13	7
12	......	......	......	......	......	1430	400	80	60	21	13	7
13	......	......	......	......	......	1490	346	110	34	21	13	7
14	......	......	......	......	......	1480	306	100	60	21	13	7
15	......	......	......	......	......	1540	249	80	44	21	13	7
16	......	......	......	......	......	1660	249	80	34	21	13	7
17	......	......	......	......	......	1650	207	80	34	21	13	7
18	......	......	......	......	......	1680	189	70	34	21	13	7
19	......	......	......	......	......	1640	207	70	28	13	13	7
20	......	......	......	......	......	1570	207	60	28	13	13	7
21	......	......	......	......	......	1440	207	52	28	13	13	7
22	......	......	......	......	450	1320	207	52	28	13	13	7
23	......	......	......	......	388	1430	189	52	60	13	13	7
24	......	......	......	......	388	1490	207	44	70	13	7	7
25	......	......	......	......	339	1480	207	34	60	13	7	7
26	......	......	......	......	270	1480	173	34	52	13	11	7
27	......	......	......	......	270	1410	207	34	44	13	7	7
28	......	......	......	......	270	1340	173	34	34	13	7	7
29	......	......	......	......	270	1400	158	34	34	13	7	7
30	......	......	......	......	270	1390	173	28	34	13	7	7
31	......	......	......	......	270	......	145	21	......	13	......	7
Total	......	......	......	......	3185	35677	13275	2192	1044	629	352	217
Mean	......	......	......	......	318	1190	428	70.7	34.8	20.3	11.7	7.00
Max.	......	......	......	......	450	1680	1320	132	70	44	13	7
Min.	......	......	......	......	270	219	145	21	21	13	7	7
Acre-ft.	......	......	......	......	6320	70700	26300	4350	2070	1250	698	430

Discharge of Florida River at Durango for 1918.
Drainage Area, 136 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7.0	2.7	10	70	90	196	58	54	32	31	22	49.0
2	7.0	2.5	10	80	90	306	52	40	31	28	22	46.0
3	7.0	2.4	7	80	88	376	78	35	31	27	21	35.0
4	7.0	2.2	10	60	110	344	90	40	39	24	21	32.0
5	7.0	2.0	10	60	131	366	83	35	39	22	21	25.0
6	7.0	1.9	10	52	141	376	108	40	35	21	21	29.0
7	6.8	1.7	10	52	165	376	112	35	32	21	21	27.0
8	6.7	1.5	28	60	165	333	106	35	32	21	21	14.0
9	6.5	1.4	28	60	162	311	110	52	58	24	20	14.0
10	6.3	1.2	28	66	224	344	165	49	317	28	20	11.0
11	6.2	1.0	28	100	182	344	178	44	246	32	19	6.8
12	6.0	.9	70	88	155	317	178	37	165	29	19	28.0
13	5.8	.7	90	86	186	311	178	39	129	24	18	6.2
14	5.7	.6	90	86	344	311	141	70	108	21	19	15.0
15	5.5	.4	90	90	397	246	131	70	90	20	19	13.0
16	5.3	1.4	80	86	478	213	143	64	78	19	18	21.0
17	5.2	2.3	80	74	478	178	118	52	70	21	15	22.0
18	5.0	3.3	35	70	483	159	102	42	64	21	16	21.0
19	4.8	4.3	35	72	478	136	93	37	55	22	15	13.0
20	4.7	5.2	35	70	462	159	93	35	52	29	14	14.0
21	4.5	6.2	35	66	361	165	86	62	52	39	14	10.0
22	4.4	7.2	52	54	322	276	72	72	52	32	14	12.0
23	4.2	8.2	35	55	441	224	86	66	49	34	14	11.0
24	4.0	9.1	35	60	473	178	70	55	42	34	14	8.2
25	3.8	10.0	35	70	499	146	78	46	35	32	27	6.2
26	3.7	11.0	52	70	392	123	62	40	35	28	35	13.0
27	3.5	12.0	52	70	376	106	58	35	35	27	27	14.0
28	3.4	13.0	52	70	414	93	52	35	35	29	27	13.0
29	3.2	......	60	78	339	83	50	32	34	24	24	11.0
30	3.0	......	60	90	256	70	50	39	32	25	44	13.0
31	2.9	......	60	......	196	......	52	32	......	24	......	14.0
Total	163.1	116.3	1312	2145	9078	7166	3033	1419	2104	813	622	567.4
Mean	5.26	4.15	42.3	71.5	293	239	97.8	45.8	70.1	26.2	20.7	18.3
Max.	7.0	13	90	100	499	376	178	72	317	39	44	49
Min.	2.9	0.4	7	52	88	70	50	32	31	19	14	62
Acre-ft.	323	231	2600	4250	18000	14200	6010	2810	4170	1610	1230	1130

Unless otherwise noted, all discharges are in cubic feet per second.

LA PLATA RIVER AT HESPERUS

Location.—At railroad bridge on Upper La Plata about 800 feet northwest of Hesperus railroad station.

Records Available.—June 15, 1904, August 11, 1904; April 1, 1906, August 11, 1906; August 24, 1910, December 31, 1910; May 25, 1917, to November 30, 1918.

Drainage Area.—Not known.

Gage.—Vertical staff.

Channel.—Probably shifts.

Winter Conditions.—Ice forms during winter months.

Co-operation—Maintained in co-operation with the State Engineer of New Mexico.

Discharge of La Plata River at Hesperus for 1917.

Drainage Area, 37 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	108	137	32.0	6.5	8.0	1.9	4.5
2	......	......	......	......	......	115	130	26.0	6.5	6.5	1.9	4.5
3	......	......	......	......	......	188	115	23.0	6.5	6.5	1.9	4.5
4	......	......	......	......	......	340	95	19.0	5.0	6.5	1.9	4.5
5	......	......	......	......	......	386	95	16.0	4.5	5.0	1.9	4.5
6	......	......	......	......	......	286	88	13.0	5.0	5.0	1.9	4.5
7	......	......	......	......	......	311	88	10.0	6.5	4.5	1.9	4.5
8	......	......	......	......	......	422	88	10.0	6.5	4.5	1.9	6.5
9	......	......	......	......	......	613	88	8.0	6.5	4.5	1.9	6.5
10	......	......	......	......	......	722	95	6.5	6.5	4.5	1.9	6.4
11	......	......	......	......	......	540	88	6.5	6.5	4.5	1.9	6.3
12	......	......	......	......	......	590	76	13.0	6.5	3.0	1.9	6.3
13	......	......	......	......	......	540	76	13.0	8.0	1.9	1.9	6.2
14	......	......	......	......	......	340	64	10.0	6.5	1.9	1.9	6.1
15	......	......	......	......	......	354	64	10.0	8.0	1.9	3.0	6.0
16	......	......	......	......	......	286	58	10.0	6.5	1.9	4.5	5.9
17	......	......	......	......	......	227	47	10.0	6.5	1.9	4.5	5.9
18	......	......	......	......	......	208	42	10.0	6.5	1.9	4.5	5.8
19	......	......	......	......	......	208	76	10.0	6.5	1.9	4.5	5.7
20	......	......	......	......	......	227	53	8.0	6.5	1.9	4.5	5.6
21	......	......	......	......	......	250	53	6.5	6.5	1.9	4.5	5.5
22	......	......	......	......	......	238	58	6.5	6.5	1.9	4.5	5.5
23	......	......	......	......	......	197	47	6.5	8.0	1.9	4.5	5.4
24	......	......	......	......	......	227	42	6.5	8.0	4.5	4.5	5.3
25	......	......	......	......	115	217	76	6.5	8.0	4.5	4.5	5.2
26	......	......	......	......	115	217	70	6.5	8.0	1.9	4.5	5.1
27	......	......	......	......	88	197	47	6.5	8.0	1.9	4.5	5.1
28	......	......	......	......	101	179	42	6.5	6.5	1.9	4.5	5.0
29	......	......	......	......	123	170	42	6.5	6.5	1.9	4.5	4.9
30	......	......	......	......	130	137	37	6.5	6.5	1.9	4.5	4.8
31	......	......	......	......	130	......	32	6.5	......	1.9	......	4.7
Total	......	......	......	......	802	9040	2209	335.5	200.5	104.3	97.1	167.2
Mean	......	......	......	......	114	301	71.3	10.8	6.68	3.36	3.24	5.39
Max	......	......	......	......	130	722	137	32	8.0	8.0	4.5	6.5
Min	......	......	......	......	88	108	32	6.5	4.5	1.9	1.9	4.5
Acre-ft.	......	......	......	......	1590	17900	4380	665	398	207	192	332

Discharge of La Plata River at Hesperus for 1918.

Drainage Area, 37 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	4.7	3.0	4.0	22	109	36	15.0	6.0	8.0	6.0	......	......
2	4.6	3.0	4.1	19	100	100	13.0	6.0	6.0	6.0	......	......
3	4.5	2.9	4.2	19	71	119	17.0	6.0	17.0	6.0	......	......
4	4.4	2.9	4.3	19	89	150	29.0	8.0	13.0	6.0	......	......
5	4.3	2.8	4.4	15	129	139	22.0	10.0	10.0	6.0	......	......
6	4.2	2.8	4.5	22	171	119	55.0	10.0	10.0	6.0	......	......
7	4.2	2.7	4.6	33	139	100	48.0	10.0	10.0	6.0	......	......
8	4.2	2.7	4.7	25	109	71	48.0	10.0	10.0	6.0	......	......
9	4.1	2.6	4.8	29	100	80	42.0	17.0	17.0	6.0	......	......
10	4.1	2.6	4.9	63	139	100	42.0	13.0	80.0	6.0	......	......
11	4.0	2.5	5.0	48	100	109	33.0	17.0	80.0	6.0	......	......
12	4.0	2.5	10.0	36	89	100	29.0	17.0	48.0	6.0	......	......
13	3.9	2.4	8.0	33	89	80	42.0	15.0	29.0	6.0	......	......
14	3.9	2.4	17.0	33	171	139	36.0	25.0	22.0	6.0	......	......
15	3.8	2.5	17.0	29	194	89	33.0	22.0	19.0	8.0	......	......
16	3.8	2.6	10.0	25	150	63	29.0	19.0	19.0	8.0	......	......
17	3.7	2.7	10.0	25	194	42	22.0	19.0	17.0	8.0	......	......
18	3.7	2.8	10.0	25	194	42	19.0	17.0	15.0	8.0	......	......
19	3.6	2.9	5.0	22	194	36	17.0	15.0	15.0	6.0	......	......
20	3.6	3.0	6.0	19	171	36	15.0	17.0	15.0	6.0	......	......
21	3.5	3.1	6.0	19	129	36	19.0	19.0	15.0	8.0	......	......
22	3.5	3.2	8.0	19	150	71	17.0	17.0	13.0	8.0	......	......
23	3.4	3.3	8.0	19	183	80	13.0	15.0	10.0	8.0	......	......
24	3.4	3.4	10.0	19	171	42	10.0	15.0	10.0	8.0	......	......
25	3.3	3.5	15.0	25	139	63	10.0	13.0	10.0	8.0	......	......
26	3.3	3.6	13.0	63	129	36	8.0	8.0	10.0	8.0	......	......
27	3.2	3.8	15.0	55	100	29	6.0	6.0	8.0	......	......	......
28	3.2	3.9	13.0	55	89	22	6.0	6.0	8.0	......	......	......
29	3.2	......	15.0	71	80	19	6.0	6.0	8.0	......	......	......
30	3.1	......	17.0	100	55	17	6.0	6.0	6.0	......	......	......
31	3.1	......	22.0	......	36	......	6.0	10.0	......	......	......	......
Total	117.5	82.1	284.5	1006	3963	2165	713.0	400.0	558.0	176.0	......	......
Mean	3.79	2.93	9.18	33.5	128	72.2	23.0	12.9	18.6	6.77	......	......
Max	4.7	3.9	22	100	194	150	55	25	80	8.0	......	......
Min	3.1	2.4	4.0	15	36	17	6.0	6.0	6.0	6.0	......	......
Acre-ft.	233	163	564	1990	7860	4290	1410	793	1110	349	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

YAMPA AND WHITE DRAINAGE

B. T. Chase, Hydrographer

YAMPA RIVER AT STEAMBOAT SPRINGS

Location.—This station was moved from the lower steel bridge to the Fifth Street bridge at Steamboat Springs on April 26, 1915. It is about one-quarter mile below Spring Creek and one-half mile above Soda Creek.

Records Available.—May 3, 1904, to October 31, 1906; March 1, 1910, to November 17, 1918.

Drainage Area.—500 square miles.

Gage.—Automatic recording gage and vertical staff gage.

Channel.—Practically permanent.

Discharge Measurements.—Made from highway bridge.

Winter Flow.—Hot Springs above keep the river practically open during the winter months.

Diversions.—There are court decrees for diversions of 115 second-feet from the Yampa River between Yampa and Steamboat Springs, and diversions of 231 second-feet from intervening tributaries. There are decrees for 258 second-feet above Yampa.

YAMPA RIVER NEAR MAYBELL

Location.—At highway bridge about three miles above Maybell in Sec. 2, T. 6 N., R. 95 W. Nearest tributary, Deception Creek, enters about one mile below.

Records Available.—April 24 to November 30, 1918. From April 17, 1904, to October 31, 1905, and from June 12, 1910, to November 30, 1912, a station was maintained at the Thornburg bridge, about nine miles below Maybell. The present station was established April 25, 1916.

Gage.—Chain gage located on highway bridge.

Channel.—Permanent.

Winter Flow.—Discharge estimated from measurements during winter months.

Diversions.—Between this station and Craig there are decrees for diversions of 131 second-feet from the Yampa River and 3,269 second-feet from intervening tributaries.

Co-operation.—Station maintained in co-operation with the United States Geological Survey during 1917.

SODA CREEK AT STEAMBOAT SPRINGS

Location.—At the Main Street bridge at Steamboat Springs, below all tributaries, the nearest being a small creek that enters from the east about 2 miles above.

Records Available.—June 8, 1910, to August 31, 1911; April 24, 1913, to November 17, 1918.

Drainage Area.—47 square miles.

Gage.—Chain gage.

Channel.—Practically permanent.

Discharge Measurements.—Made from highway bridge.

Discharge of Yampa River at Steamboat Springs for 1917

Drainage Area, 500 Square Miles. Altitude, 6,680 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	730	1620	3300	416	120	172	158	132
2	......	......	......	......	800	1340	2840	366	120	158	172	120
3	......	......	......	......	765	1390	2520	299	120	120	132	110
4	......	......	......	......	880	1740	2450	278	120	100	132	110
5	......	......	......	......	960	2080	2150	278	120	100	132	117
6	......	......	......	......	800	1870	1940	278	120	100	120	124
7	......	......	......	......	840	1870	1740	259	144	90	132	120
8	......	......	......	......	880	2370	1740	222	144	81	132	115
9	......	......	......	......	1000	3110	1560	204	120	81	132	110
10	......	......	......	......	1290	3700	1500	222	120	81	120	110
11	......	......	......	......	1500	4100	1240	222	120	90	110	104
12	......	......	......	......	1740	3900	1040	188	132	100	110	104
13	......	......	......	......	1870	3900	960	204	120	100	110	108
14	......	......	......	......	2300	4000	880	222	158	100	132	104
15	......	......	......	......	2600	4300	765	204	144	100	132	102
16	......	......	......	......	3110	4730	730	188	144	100	110	100
17	......	......	......	730	3300	4950	590	172	204	100	120	98
18	......	......	......	660	3500	5060	530	172	204	100	100	98
19	......	......	......	590	3300	5280	500	172	204	100	100	98
20	......	......	......	470	3500	5280	443	172	188	100	132	98
21	......	......	......	560	2930	5170	391	158	188	100	110	100
22	......	......	......	590	2300	5170	366	144	188	100	120	104
23	......	......	......	590	1870	5170	320	144	172	100	132	104
24	......	......	......	590	1940	4950	343	158	204	120	132	104
25	......	......	......	1040	1800	4840	391	144	188	144	120	104
26	......	......	......	1740	1680	4730	366	144	204	132	120	106
27	......	......	......	1620	1390	4400	366	172	204	132	120	106
28	......	......	......	1200	1340	4100	320	188	188	132	110	106
29	......	......	......	960	1290	4100	500	172	172	132	120	108
30	......	......	......	765	1390	3900	625	144	172	158	132	108
31	......	......	......	......	1560	......	695	144	......	158	......	108
Total	......	......	......	12105	55155	113120	34101	6450	4746	3481	3734	3340
Mean	......	......	......	......	1780	3770	1100	208	158	112	124	108
Max	......	......	......	......	3500	5280	3300	416	204	158	172	......
Min	......	......	......	......	730	1340	320	144	120	81	100	......
Acre-ft.	......	......	......	24000	109000	224000	67600	12800	9400	6890	7380	6640

Discharge of Yampa River at Steamboat Springs for 1918.

Drainage Area, 500 Square Miles. Altitude, 6,680 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	108	125	125	652	660	1620	660	144	100	172	204	......
2	108	125	125	660	800	1680	660	144	100	185	204	......
3	108	125	125	660	960	1620	590	172	100	198	204	......
4	108	125	125	660	960	1500	590	204	132	211	204	......
5	108	125	125	660	1040	1500	625	172	144	224	278	......
6	108	125	125	660	800	1680	660	172	172	237	278	......
7	108	125	125	660	765	1940	625	172	278	250	278	......
8	108	125	125	660	2010	2010	530	172	278	264	278	......
9	124	125	132	660	1740	2150	660	172	278	278	278	......
10	124	125	132	660	2010	2930	800	204	240	159	240	......
11	124	125	172	660	1870	3900	800	172	204	204	240	......
12	124	125	207	660	1500	4100	800	204	172	240	204	......
13	124	125	207	660	1390	4510	800	172	204	240	204	......
14	124	125	207	660	1200	4730	800	172	278	240	104	......
15	124	125	207	660	1390	4100	660	172	240	204	172	......
16	124	125	207	625	1870	3300	530	172	240	204	172	......
17	124	125	207	590	1870	3300	530	144	172	204	172	......
18	124	125	207	530	1800	2600	530	144	120	204	......	......
19	124	125	207	530	1740	2600	660	144	110	204	......	......
20	124	125	207	470	1740	2760	625	144	100	240	......	......
21	124	125	207	470	1870	2760	590	144	100	240	......	......
22	124	125	207	470	2370	2600	530	144	100	320	......	......
23	124	125	207	530	2680	2600	470	120	81	320	......	......
24	124	125	240	530	2840	2600	240	120	81	320	......	......
25	124	125	278	590	2680	2300	278	120	94	240	......	......
26	124	125	259	660	2520	2010	320	120	107	204	......	......
27	124	125	470	590	2300	1800	366	120	120	204	......	......
28	124	125	652	590	2010	1740	416	100	133	204	......	......
29	124	......	652	530	1870	1500	470	100	146	204	......	......
30	124	......	652	530	1680	960	470	100	159	204	......	......
31	124	......	652	......	1560	......	144	100	......	204	......	......
Total	3716	3500	7775	18127	52435	75400	17429	4656	4783	7125	3814	......
Mean	120	125	251	604	1690	2510	562	150	159	230	224	......
Max	124	125	652	660	2840	4730	800	204	278	320	......	......
Min	108	125	125	470	660	960	144	100	81	172	......	......
Acre-ft.	7380	6940	15400	35900	104000	149000	34600	9220	9460	14100	7550	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Yampa River at Maybell for 1917.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	2050	7120	10200	11400	1920	470	386	352	328
2	......	......	......	1380	7580	9500	10200	1550	440	356	308	369
3	......	......	......	800	6210	8540	9200	1220	415	290	250	400
4	......	......	......	800	3740	9190	7820	1200	390	350	373	395
5	......	......	......	760	5390	9840	7820	1160	406	470	395	382
6	......	......	......	800	4810	10500	7340	1120	422	365	405	368
7	......	......	......	2180	5190	10000	7110	930	440	307	400	328
8	......	......	......	2760	2760	9500	6880	840	500	340	400	348
9	......	......	......	3080	4620	11200	6650	760	485	307	390	340
10	......	......	......	3910	6100	13300	6750	760	470	307	390	330
11	......	......	......	3910	7580	14300	5800	690	440	288	415	320
12	......	......	......	3740	7820	15600	5100	655	415	277	400	300
13	......	......	......	3910	8060	14800	4810	620	440	300	382	290
14	......	......	......	3740	9500	13800	3910	690	500	307	382	290
15	......	......	......	3910	12100	13300	3600	655	440	307	382	300
16	......	......	......	2920	13300	13800	3240	630	470	307	420	310
17	......	......	......	2320	15600	14300	2760	575	440	300	430	320
18	......	......	......	2920	16600	15000	2600	612	415	307	420	330
19	......	......	......	2610	17300	15300	2460	593	369	300	382	340
20	......	......	......	2050	17000	15000	2320	559	369	324	382	340
21	......	......	......	2180	16600	14800	2320	511	356	348	390	340
22	......	......	......	2180	16300	14600	2180	531	362	356	382	330
23	......	......	......	3570	13100	14300	2180	500	369	348	348	320
24	......	......	......	5190	11900	14800	2050	464	365	369	348	310
25	......	......	......	6210	12400	14300	1790	421	340	382	340	300
26	......	......	......	6430	12900	13800	2050	451	356	377	303	300
27	......	......	......	10200	11200	13600	1790	479	369	361	397	300
28	......	......	......	8060	9260	13100	1700	440	356	352	278	310
29	......	......	......	6210	8540	12500	1550	500	390	348	288	300
30	......	......	......	6670	8780	11400	1800	530	369	348	288	300
31	......	......	......	......	11200	......	1920	500	......	352	......	300
Total	......	......	......	107450	310560	384170	139100	23066	12368	10436	10920	10138
Mean	......	......	......	3580	10000	12800	4490	744	412	337	364	327
Max	......	......	......	10200	17300	15300	11400	1920	500	470	430	400
Min	......	......	......	760	3740	8540	1550	421	356	277	250	290
Acre-ft.	......	......	......	213000	615000	762000	276000	45700	24500	20700	21700	20100

Discharge of Yampa River at Maybell for 1918.

Drainage Area, 3,670 Square Miles. Altitude, 5,900 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	300	340	380	2350	1800	5380	5930	810	248	555	506	......
2	300	342	380	2420	2420	4620	5390	690	240	555	485	......
3	300	344	380	2550	3220	4350	4850	570	252	555	520	......
4	299	346	380	2690	4200	5000	4310	450	240	555	555	......
5	298	348	380	2040	5380	5570	3770	485	240	590	555	......
6	297	350	410	1690	6580	6050	3230	485	252	590	590	......
7	296	350	410	1410	6790	6680	2690	485	280	555	606	......
8	296	350	410	1470	7840	7310	2350	520	320	520	555	......
9	297	350	410	1630	7310	7420	2100	520	332	450	464	......
10	298	350	410	2290	7420	8050	1920	485	300	450	506	......
11	299	350	800	2690	6470	8710	1980	485	300	450	485	......
12	300	350	800	3300	5190	9380	1980	485	320	420	450	......
13	302	350	950	3700	4350	9610	1740	420	340	850	450	......
14	304	350	1100	3700	4270	9840	1580	420	360	1050	450	......
15	306	350	950	4200	5000	10100	1580	520	380	850	450	......
16	308	360	670	3220	5760	9840	1630	450	400	715	485	......
17	310	360	670	2550	6890	9150	1520	420	420	590	520	......
18	312	360	670	2220	7000	8930	1800	420	441	590	520	......
19	314	360	715	1980	6890	8160	2350	390	462	715	485	......
20	316	360	760	1860	6260	7210	2100	365	483	670	438	......
21	318	360	760	1630	6470	7420	2420	320	504	590	506	......
22	320	360	950	1630	5950	7000	1980	300	525	520	485	......
23	322	360	1150	1740	5950	7100	1630	300	546	450	485	......
24	324	360	1300	1860	6580	7100	1410	300	567	438	520	......
25	326	360	1410	1860	7210	7210	1470	320	588	402	450	......
26	328	360	1520	2290	7310	7100	1300	320	609	390	420	......
27	330	360	1740	2420	7100	7000	1200	300	630	420	485	......
28	332	360	1920	2480	6580	7000	1100	280	590	450	485	......
29	334	......	2160	2160	6470	7000	1100	280	555	485	485	......
30	336	......	1920	1920	5850	6470	1050	300	590	520	485	......
31	338	......	2100	......	5760	......	930	280	......	520	......	......
Total	9660	9900	28965	69950	182270	221760	70390	13175	12314	17460	14881	......
Mean	312	354	934	2330	5880	7390	2270	425	410	563	496	......
Max	338	360	2100	4200	7420	10100	5930	810	630	1050	606	......
Min	296	340	380	1410	1800	4350	930	280	240	390	420	......
Acre-ft	19200	19700	57400	139000	362000	440000	140000	26100	24400	34600	29500	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Soda Creek at Steamboat Springs for 1917.
Drainage Area, 47 Square Miles. Altitude, 6,680 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	69	266	383	30.0	3.0	......	......	......
2	......	......	......	......	81	254	354	27.0	2.7	......	......	......
3	......	......	......	......	88	254	340	27.0	2.4	......	......	......
4	......	......	......	......	81	266	327	27.0	1.8	......	......	......
5	......	......	......	......	118	266	327	21.0	1.8	......	......	......
6	......	......	......	......	134	278	314	21.0	3.0	......	......	......
7	......	......	......	......	143	290	314	21.0	2.2	......	......	......
8	......	......	......	......	180	290	327	21.0	1.1	......	......	......
9	......	......	......	......	200	302	278	21.0	0.4	......	......	......
10	......	......	......	......	210	327	210	15.0	0.4	......	......	......
11	......	......	......	......	243	368	200	15.0	0.9	......	......	......
12	......	......	......	59	266	398	200	15.0	1.4	......	......	......
13	......	......	......	55	314	430	190	15.0	0.9	......	......	......
14	......	......	......	59	327	430	171	15.0	1.8	......	......	......
15	......	......	......	59	340	430	161	15.0	0.9	......	......	......
16	......	......	......	51	354	462	118	15.0	0.9	......	......	......
17	......	......	......	48	383	642	110	12.0	0.9	......	......	......
18	......	......	......	46	383	430	95	10.0	0.9	......	......	......
19	......	......	......	45	327	430	69	6.0	0.9	......	......	......
20	......	......	......	48	302	430	55	6.0	0.9	......	......	......
21	......	......	......	51	290	430	48	6.0	0.9	......	......	......
22	......	......	......	51	278	430	45	6.0	0.9	......	......	......
23	......	......	......	51	243	446	45	6.0	0.9	......	......	......
24	......	......	......	55	232	462	39	4.5	0.9	......	......	......
25	......	......	......	59	221	462	36	6.0	0.9	......	......	......
26	......	......	......	59	200	462	33	6.0	0.9	......	......	......
27	......	......	......	59	190	462	33	10.0	0.9	......	......	......
28	......	......	......	59	200	462	33	15.0	0.9	......	......	......
29	......	......	......	64	221	462	30	10.0	0.9	......	......	......
30	......	......	......	69	237	462	27	6.0	0.9	......	......	......
31	......	......	......	......	254	430	30	6.0	......	......	......	......
Total	......	......	......	1047	7109	11571	4942	436.5	38.2	......	......	......
Mean	......	......	......	55.1	229	386	159	14.1	1.27	......	......	......
Max	......	......	......	......	383	462	383	30.0	3.0	......	......	......
Min	......	......	......	......	69	254	27	4.5	0.4	......	......	......
Acre-ft	......	......	......	2080	14100	23000	9780	867	75.6	......	......	......

Discharge of Soda Creek at Steamboat Springs for 1918.
Drainage Area, 47 Square Miles. Altitude, 6,680 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	182	63	235.0		.70	1.3	......
2	......	......	......	......	......	182	44	68.0		.70	1.3	......
3	......	......	......	......	......	224	44	68.0		.70	1.3	......
4	......	......	......	......	......	262	44	65.0		.70	1.3	......
5	......	......	......	......	235	276	33	61.0		.80	1.3	......
6	......	......	......	......	248	342	33	58.0		.80	1.3	......
7	......	......	......	......	262	550	26	55.0		.80	1.4	......
8	......	......	......	......	212	442	18	51.0		.80	1.4	......
9	......	......	......	......	172	442	15	48.0	Average—.70 c. f. s.	.80	1.4	......
10	......	......	......	......	172	532	40	45.0		.80	1.5	......
11	......	......	......	......	172	514	40	41.0		.90	1.5	......
12	......	......	......	......	172	694	28	38.0		.90	1.4	......
13	......	......	......	......	152	568	26	35.0		.90	1.4	......
14	......	......	......	......	112	568	20	31.0		1.0	1.4	......
15	......	......	......	......	235	622	18	28.0		1.0	1.3	......
16	......	......	......	......	248	532	26	25.0		1.0	1.3	......
17	......	......	......	......	212	550	26	21.0		1.0	1.3	......
18	......	......	......	......	192	532	26	18.0		1.0	......	......
19	......	......	......	......	172	496	20	15.0		1.0	......	......
20	......	......	......	......	192	460	11	11.0		1.3	......	......
21	......	......	......	......	192	424	11	8.0		1.3	......	......
22	......	......	......	......	192	356	11	5.0		1.3	......	......
23	......	......	......	......	206	496	9	2.0		1.4	......	......
24	......	......	......	......	220	356	9	1.0		1.4	......	......
25	......	......	......	......	234	289	11	1.0		1.3	......	......
26	......	......	......	......	248	224	7	.60		1.3	......	......
27	......	......	......	......	262	202	15	.60		1.3	......	......
28	......	......	......	......	276	142	4	.60		1.3	......	......
29	......	......	......	......	289	124	11	.60		1.3	......	......
30	......	......	......	......	276	103	7	.60		1.3	......	......
31	......	......	......	......	235	......	68	.70		1.3	......	......
Total	......	......	......	......	5790	11687	764	1037.7	21	32.1	23.1	......
Mean	......	......	......	......	214	390	24.6	33.5	.70	1.04	1.36	......
Max	......	......	......	......	......	694	68	235	......	1.4	......	......
Min	......	......	......	......	......	103	4	.60	......	.70	......	......
Acre-ft	......	......	......	......	11500	23200	1510	2060	41.7	64.0	45.9	......

Unless otherwise noted, all discharges are in cubic feet per second.

ELK HEAD CREEK NEAR CRAIG

Location.—One mile above the mouth at bridge on road between Steamboat Springs and Craig, the latter being 6 miles west. No tributary between the station and the mouth and none for several miles above.

Records Available.—April 27 to September 7, 1906; April 17, 1910, to November 24, 1918.

Drainage Area.—249 square miles.

Gage.—Chain gage.

Channel.—Practically permanent.

Diversions.—There are court decrees for diversions of 45 second-feet from Elk Head Creek above the station and 48 second-feet from tributaries entering above. In addition, there are conditional decrees for reservoir diversions of 177,000 acre-feet from Elk Head Creek and a diversion of 587 second-feet from the North Fork.

FORTIFICATION CREEK AT CRAIG

Location.—One-eighth mile east of Craig on the road to Hayden. No tributaries between the station and the mouth, and none for some distance above.

Records Available.—June 12, 1905, to July 30, 1906; March 5, 1910, to September 30, 1918.

Drainage Area.—256 square miles.

Gage.—Chain gage.

Channel.—Very shifting.

Discharge Measurements.—Made from bridge.

Diversions.—There are court decrees for diversions of 91 second-feet from Fortification Creek above the station and 20 second-feet from tributaries entering above. There is also a conditional decree for a diversion of 235,000 acre-feet from Fortification Creek.

WILLIAMS RIVER AT HAMILTON

Location.—Near Hamilton, at highway bridge, on the road from Meeker to Craig. Morapos Creek, the nearest tributary, enters some distance below the station.

Records Available.—April 29, 1904, to October 31, 1906; April 15, 1910, to November 30, 1918.

Drainage Area.—341 square miles.

Gage.—Chain gage.

Channel.—Shifting.

Discharge Measurements.—Made from highway bridge.

Winter Flow.—Discharge estimates from measurements.

Diversions.—There are court decrees for diversions of 40 second-feet from Williams River above the station, and 7 second-feet below. There are also decrees for diversions of 87 second-feet from tributaries entering above.

Discharge of Elk Head Creek near Craig for 1917.

Drainage Area, 249 Square Miles. Altitude, 6,200 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	273	988	261	8.0	0.5	1.5	1.5	......
2	......	......	......	......	675	859	250	14.0	0.7	1.5	2.0	......
3	......	......	......	......	572	976	169	4.0	0.5	1.5	6.0	......
4	......	......	......	......	296	1180	181	1.5	0.3	2.0	5.0	......
5	......	......	......	......	457	1110	158	1.5	0.3	2.0	6.0	......
6	......	......	......	......	261	836	123	2.0	0.1	1.5	4.0	......
7	......	......	......	......	307	940	123	3.0	0.1	1.0	3.0	......
8	......	......	......	......	422	1000	100	1.5	0.3	2.0	2.0	......
9	......	......	......	......	526	1220	89	4.0	0.5	1.0	2.0	......
10	......	......	......	......	641	1360	69	8.0	0.3	2.0	2.0	......
11	......	......	......	......	744	1380	59	24.0	0.7	2.0	2.0	......
12	......	......	......	......	825	1310	40	5.0	1.0	2.0	0.7	......
13	......	......	......	......	836	1060	24	4.0	1.5	1.5	1.0	......
14	......	......	......	......	1260	976	24	14.0	1.0	1.0	1.0	......
15	......	......	......	......	1350	1040	18	10.0	0.7	0.5	1.5	......
16	......	......	......	......	1550	1020	24	5.0	0.5	0.7	2.0	......
17	......	......	......	......	1470	1000	18	5.0	0.5	1.0	2.0	......
18	......	......	......	......	1490	964	10	4.0	0.7	1.5	2.0	......
19	......	......	......	......	1510	871	14	8.0	0.7	1.5	1.0	......
20	......	......	......	......	1420	802	49	5.0	0.7	2.0	1.0	......
21	......	......	......	......	1370	733	24	4.0	0.7	2.0	1.5	......
22	......	......	......	......	1020	675	8	3.0	1.0	1.5	3.0	......
23	......	......	......	468	1190	606	5	3.0	0.7	2.0	2.0	......
24	......	......	......	664	1170	595	5	1.5	0.5	2.0	1.5	......
25	......	......	......	710	1160	514	6	1.5	1.0	1.5	1.0	......
26	......	......	......	618	1060	468	5	2.0	0.7	1.5	1.5	......
27	......	......	......	1040	767	434	8	0.7	1.0	4.0	2.0	......
28	......	......	......	1060	664	342	4	1.0	0.5	3.0	3.0	......
29	......	......	......	491	790	307	5	0.5	0.7	3.0	4.0	......
30	......	......	......	411	1180	307	4	0.7	1.5	2.0	4.0	......
31	......	......	......	......	1230	......	24	0.7	......	5.0	......	......
Total	......	......	......	5462	28486	25873	1900	150.1	19.9	57.2	71.2	......
Mean	......	......	......	683	919	863	61.3	4.84	0.663	1.84	23.7	......
Max.	......	......	......	......	1550	1380	261	24	1.5	5.0	6.0	......
Min.	......	......	......	......	261	307	4	0.5	0.1	0.5	0.7	......
Acre-ft.	......	......	......	10800	56500	51300	3770	298	39.4	113	141	......

Discharge of Elk Head Creek Near Craig for 1918.

Drainage Area, 249 Square Miles. Altitude, 6,200 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	262	457	354	8.0	1.0	.25	1.0	3	......
2	......	......	......	319	618	250	2.0	.75	.50	1.0	3	......
3	......	......	......	285	802	250	3.0	.25	.50	3.0	3	......
4	......	......	......	79	894	239	8.0	.25	0	3.0	3	......
5	......	......	......	59	1010	239	10.0	.50	0	6.0	2	......
6	......	......	......	49	1020	239	6.0	.50	.50	10.0	2	......
7	......	......	......	79	1170	227	6.0	.50	.50	8.0	1	......
8	......	......	......	79	1070	227	10.0	.50	.50	6.0	1	......
9	......	......	......	262	1040	193	3.0	.50	.75	2.0	1	......
10	......	......	......	365	825	158	6.0	0	.50	1.0	3	......
11	......	......	......	377	664	170	6.0	.50	.50	1.0	3	......
12	......	......	......	595	480	170	18.0	0	.50	1.0	2	......
13	......	......	......	480	480	124	6.0	0	.50	1.0	3	......
14	......	......	......	584	595	101	49.0	.50	.50	1.0	3	......
15	......	......	......	595	653	89	18.0	1.0	.50	1.0	3	......
16	......	......	......	457	572	79	10.0	0	.50	1.0	3	......
17	......	......	......	319	469	18	18 0	.25	.50	1.0	3	......
18	......	......	......	69	641	49	10.0	0	.50	1.0	2	......
19	......	......	......	181	561	24	8.0	.50	.50	1.0	1	......
20	......	......	......	124	584	18	6.0	.50	.50	1.0	1	......
21	......	......	......	135	503	18	8.0	0	.50	3.0	1	......
22	......	......	......	158	469	49	10.0	.25	.50	4.0	1	......
23	......	......	......	250	423	79	2.0	0	.50	4.0	1	......
24	......	......	170	250	469	79	4.5	0	.75	6.0	2	......
25	......	......	250	250	434	49	2.0	.25	2.0	3.0	......	......
26	......	......	377	181	469	30	1.0	.50	3.0	2.0	......	......
27	......	......	319	296	434	14	1.0	0	3.0	1.0	......	......
28	......	......	181	354	342	18	1.0	.50	3.0	1.0	......	......
29	......	......	216	216	308	18	1.0	.25	2.0	2.0	......	......
30	......	......	239	319	308	30	1.0	0	1.0	2.0	......	......
31	......	......	250	......	296	......	.5	0	......	2.0	......	......
Total	......	......	2002	8028	19060	3602	243	9.75	25.25	81	51	......
Mean	......	......	250	268	615	120	7.84	.315	.842	2.61	2.12	......
Max.	......	......	......	595	1170	354	49	1.0	3	10	......	......
Min.	......	......	......	49	296	14	.5	0	0	1	......	......
Acre-ft.	......	......	3970	15900	37800	7140	482	19.4	50.1	160	101	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Fortification Creek at Craig for 1917.
Drainage Area, 256 Square Miles. Altitude, 6,185 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	581	377	371	134.0	1.2	0	0.3	0.3	......
2	......	......	......	415	631	262	88.0	2.0	0	0.3	0	......
3	......	......	......	307	467	319	46.0	1.6	0	0.3	0.6	......
4	......	......	......	280	349	343	41.0	0.6	0	0.3	0.3	......
5	......	......	......	291	302	296	36.0	0.9	0	0	0.6	......
6	......	......	......	535	285	206	18.0	0.9	0	0	0.6	......
7	......	......	......	535	195	246	16.0	0.6	0	0.6	0.9	......
8	......	......	......	609	184	274	16.0	0.6	0	0	0.6	......
9	......	......	......	711	257	382	12.4	0.6	0	0	0.3	......
10	......	......	......	711	343	432	10.8	0.6	0	0	0.6	......
11	......	......	......	700	343	467	7.8	0.6	0.6	0	0	......
12	......	......	......	625	349	325	4.0	0	0.6	0	0	......
13	......	......	......	631	343	313	3.0	0	0.6	0	0	......
14	......	......	......	489	473	296	2.0	0	0	0	0	......
15	......	......	......	450	546	332	2.0	0	0	0	0.3	......
16	......	......	......	296	603	376	2.0	0	0	0	0.6	......
17	......	......	......	291	557	360	1.6	0	0	0	0.6	......
18	......	......	......	302	557	371	1.2	0	0	0	2.0	......
19	......	......	......	168	524	319	1.6	0	0	0	1.6	......
20	......	......	......	112	495	285	1.2	0	0	0	2.0	......
21	......	......	......	246	444	291	0.6	0	0	0	1.6	......
22	......	......	......	393	319	262	1.6	0	0	0	0.9	......
23	......	......	......	456	325	251	1.2	0	0	0	2.0	......
24	......	......	......	438	343	224	0.6	0	0	0	2.0	......
25	......	......	......	444	371	201	0.6	0	0	0.6	1.6	......
26	......	......	......	524	313	190	0.6	0	0.6	1.2	1.2	......
27	......	......	......	593	291	168	2.0	0	0	1.2	1.2	......
28	......	......	......	360	229	139	1.6	0	0	0.9	0.3	......
29	......	......	......	432	262	123	1.6	0	0	0.6	0.6	......
30	......	......	......	168	354	123	3.0	0	0	0	0.9	......
31	......	......	......	......	432	......	1.6	0	......	0.6	......	......
Total	......	......	......	13093	11863	8547	459.6	10.2	2.4	6.9	24.2	......
Mean	......	......	......	436	383	285	14.8	0.329	.08	0.222	0.81	......
Max.	......	......	......	711	631	467	134	2.0	0.6	1.2	2.0	......
Min.	......	......	......	112	184	123	0.6	0	0	0	0	......
Acre-ft.	......	......	......	25900	23600	17000	910	20.2	4.76	13.6	48.2	......

Discharge of Fortification Creek at Craig for 1918.
Drainage Area, 256 Square Miles. Altitude, 6,185 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	67	115	75	1.6	0	0	......	......	......
2	......	......	......	71	185	75	0.2	0	0	......	......	......
3	......	......	......	67	237	71	0.6	0	0	......	......	......
4	......	......	......	51	313	80	0.6	0	0	......	......	......
5	......	......	......	43	360	90	0.4	0	0	......	......	......
6	......	......	......	51	328	90	0.2	0	0	......	......	......
7	......	......	......	43	392	100	0.4	0	0	......	......	......
8	......	......	......	39	306	100	1.6	0	0	......	......	......
9	......	......	......	63	292	90	1.2	0	0	......	......	......
10	......	......	......	120	243	80	2.5	0	0	......	......	......
11	......	......	424	125	191	71	21.0	0	0	......	......	......
12	......	......	360	179	131	71	4.0	0	0	......	......	......
13	......	......	488	185	131	63	80.0	0	0	......	......	......
14	......	......	137	224	161	51	35.0	0	0	......	......	......
15	......	......	131	185	217	43	12.0	0	0	......	......	......
16	......	......	110	105	285	35	7.5	0	0	......	......	......
17	......	......	90	80	285	27	5.0	0	0	......	......	......
18	......	......	85	59	243	21	3.0	0	0	......	......	......
19	......	......	120	63	204	16	2.0	0	0	......	......	......
20	......	......	90	47	211	10	2.0	0	0	......	......	......
21	......	......	100	43	179	43	5.0	0	0	......	......	......
22	......	......	110	51	161	47	14.0	0	0	......	......	......
23	......	......	75	71	179	47	5.0	0	0	......	......	......
24	......	......	85	71	198	18	4.0	0	0	......	......	......
25	......	......	90	90	185	18	3.0	0	0	......	......	......
26	......	......	80	85	143	14	2.5	0	0	......	......	......
27	......	......	100	90	120	14	1.6	0	0	......	......	......
28	......	......	95	80	110	4	0.6	0	0	......	......	......
29	......	......	80	63	95	4	0.4	0	0	......	......	......
30	......	......	59	71	85	3	0	0	0	......	......	......
31	......	......	67	......	71	......	0	0	......	......	......	......
Total	......	......	2976	2582	6356	1471	216.9	0	0	......	......	......
Mean	......	......	142	86.1	205	49.0	7.00	0	0	......	......	......
Max.	......	......	......	224	392	100	80	0	0	......	......	......
Min.	......	......	......	39	71	3	0	0	0	......	......	......
Acre-ft.	......	......	5920	5120	12600	2920	430	0	0	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Williams River at Hamilton for 1917.

Drainage Area, 341 Square Miles. Altitude, 6,400 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	375	1400	1330	222	85	79	63	67
2	......	......	......	......	375	1150	1240	191	85	73	68	71
3	......	......	......	......	300	1480	1190	181	85	73	68	75
4	......	......	......	......	360	1870	1120	172	73	63	68	70
5	......	......	......	......	360	1330	1060	163	73	63	68	68
6	......	......	......	......	246	1380	990	155	63	63	68	66
7	......	......	......	......	345	1430	924	147	63	63	68	64
8	......	......	......	......	315	1950	880	147	63	59	68	62
9	......	......	......	......	456	2600	860	147	63	59	68	62
10	......	......	......	234	473	3190	820	139	63	59	68	62
11	......	......	......	211	547	2700	760	139	63	55	68	62
12	......	......	......	200	604	2410	902	131	63	55	63	62
13	......	......	......	246	990	2460	623	131	63	59	63	62
14	......	......	......	222	1530	2430	566	131	59	63	63	62
15	......	......	......	200	2080	2510	456	131	55	68	63	62
16	......	......	......	234	2190	2570	439	131	55	68	63	62
17	......	......	......	234	2460	2620	390	131	59	63	63	62
18	......	......	......	191	2540	2520	345	131	59	59	63	62
19	......	......	......	172	2540	2380	345	131	59	55	68	62
20	......	......	......	172	2380	2300	330	115	59	55	68	62
21	......	......	......	191	1970	2220	300	115	63	55	68	62
22	......	......	......	211	1380	2190	286	115	63	59	68	62
23	......	......	......	330	1480	2110	286	107	73	59	68	62
24	......	......	......	422	1580	1920	259	99	73	59	68	62
25	......	......	......	456	1680	1870	246	99	92	59	63	62
26	......	......	......	604	1430	1790	234	85	123	59	63	64
27	......	......	......	456	1280	1710	222	85	123	59	63	66
28	......	......	......	375	1240	1630	200	99	115	63	63	68
29	......	......	......	345	1260	1580	200	92	107	63	63	64
30	......	......	......	259	1380	1480	246	85	85	63	63	62
31	......	......	......	......	1710	......	259	85	......	63	......	62
Total	......	......	......	5965	37856	61180	18308	4032	2227	1915	1970	1983
Mean	......	......	......	284	1220	2040	590	130	74.2	61.8	65.6	64.0
Max.	......	......	......	......	2540	3190	1330	222	123	79	68	......
Min.	......	......	......	......	246	1150	200	85	55	55	63	......
Acre-ft.	......	......	......	11800	75000	121000	36300	7990	4410	3800	3900	3940

Discharge of Williams River at Hamilton for 1918.

Drainage Area, 341 Square Miles. Altitude, 6,400 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	62	57	98	120	270	842	415	102	29	48	130	......
2	62	57	98	120	355	804	370	93	29	48	130	......
3	62	57	98	102	430	785	340	93	29	48	111	......
4	62	57	98	48	600	804	325	84	29	48	111	......
5	62	57	115	48	804	842	325	68	37	48	111	......
6	62	57	115	61	1010	842	282	68	48	54	98	......
7	62	57	115	68	1120	902	270	68	48	54	120	......
8	62	57	115	93	1120	842	232	68	48	61	150	......
9	62	57	106	102	902	842	245	61	48	68	190	......
10	62	57	98	111	842	1100	245	61	48	84	204	......
11	62	57	90	150	785	1220	340	54	48	71	204	......
12	62	57	82	170	747	1330	295	48	48	71	184	......
13	62	57	74	257	618	1330	310	48	42	68	160	......
14	62	57	66	257	902	1480	270	48	37	68	160	......
15	62	57	58	257	1170	1330	245	48	37	68	140	......
16	62	57	50	210	1580	1330	210	48	48	68	140	......
17	62	57	42	180	1580	1200	200	48	48	61	130	......
18	62	57	61	150	1480	1150	160	48	48	61	130	......
19	62	57	61	150	1320	968	160	48	48	52	111	......
20	62	57	68	180	1170	880	160	42	48	48	102	......
21	62	86	68	180	1120	842	180	42	37	48	102	......
22	62	86	84	160	1270	804	170	42	37	52	76	......
23	62	86	93	160	1270	902	170	37	37	52	76	......
24	62	86	102	160	1400	1220	170	37	37	54	76	......
25	62	86	102	160	1320	1290	130	37	37	52	65	......
26	57	86	111	160	1120	968	130	37	37	52	65	......
27	57	86	120	160	1200	510	130	37	42	57	61	......
28	57	86	120	180	968	492	111	29	48	61	68	......
29	57	......	120	200	968	475	111	29	48	65	68	......
30	57	......	120	245	861	415	102	29	48	84	68	......
31	57	......	120	......	766	......	102	29	......	98	......	......
Total	1892	1828	2868	4599	31068	28741	6905	1631	1253	1872	3541	......
Mean	61.0	65.3	92.5	153	1000	955	223	52.6	41.8	60.4	118	......
Max.	62	86	120	257	1580	1480	415	102	48	98	204	......
Min.	57	57	42	48	270	415	102	29	29	48	61	......
Acre-ft.	3750	3630	5690	9100	61500	56800	13700	3230	2490	3710	7020	......

Unless otherwise noted, all discharges are in cubic feet per second.

ELK RIVER AT HINMAN PARK

Location.—At Hinman Park just above the mouth of South Fork and 8 miles above Clark.

Records Available.—May 25, 1912, to October 18, 1918.

Drainage Area.—61 square miles.

Gage.—Bristol automatic gage.

Channel.—Rough, but permanent.

Discharge Measurements.—Made from cable and car.

Winter Flow.—Ice causes backwater. Station discontinued during the winter months.

Co-operation.—Station is maintained by the State Engineer in co-operation with the Elk River Irrigation & Construction Co.

ELK RIVER NEAR CLARK

Location.—At Kinney's ranch, 2 miles above Clark postoffice.

Records Available.—May 1, 1910, to September 30, 1918.

Drainage Area.—206 square miles.

Gage.—Chain gage.

Channel.—Rough, but permanent.

Diversions.—There are court decrees for diversions of 4 second-feet from Elk River above this station and 25 second-feet from the tributaries entering above.

Co-operation.—The State Engineer maintains the station in co-operation with the Elk River Irrigation & Construction Co.

ELK RIVER NEAR TRULL

Location.—Two miles southwest of Trull postoffice on the road between Steamboat Springs and Hayden; below all tributaries; none above the station for several miles.

Records Available.—May 2, 1904, to August 16, 1906; May 1, 1910, to November 30, 1918.

Drainage Area.—415 square miles.

Gage.—Chain gage.

Channel.—Fairly permanent.

Discharge Measurements.—Made from highway bridge.

Winter Flow.—Discharge estimated from measurements.

Diversions.—Between this station and that near Clark there are court decrees for diversions of 111 second-feet from Elk River and 62 second-feet from intervening tributaries. There are no decrees for diversions below the station.

Discharge of Elk River at Hinman Park for 1917.

Drainage Area, 61 Square Miles. Altitude, 7,800 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	200	1070	1410	375	115	60	54	......
2	......	......	......	......	163	1090	1320	280	115	75	48	......
3	......	......	......	......	145	1030	1260	200	115	60	54	......
4	......	......	......	......	140	1160	1220	210	105	54	54	......
5	......	......	......	......	151	1110	1140	210	105	54	62	......
6	......	......	......	......	145	1150	1170	200	105	54	62	......
7	......	......	......	......	163	1220	1120	190	105	54	62	......
8	......	......	......	......	181	1350	1090	182	95	48	54	......
9	......	......	......	......	258	1450	1140	159	75	48	48	......
10	......	......	......	......	374	1530	1020	170	67	48	48	......
11	......	......	......	......	324	1450	1000	159	95	48	48	......
12	......	......	......	......	342	1530	904	159	95	48	48	......
13	......	......	......	......	417	1480	838	137	75	48	42	......
14	......	......	......	......	512	1390	794	137	85	44	42	......
15	......	......	......	......	653	1450	758	148	75	44	42	......
16	......	......	......	......	743	1530	656	159	67	44	54	......
17	......	......	......	......	763	1470	588	137	60	44	54	......
18	......	......	......	......	820	1450	538	137	68	44	32	......
19	......	......	......	......	830	1510	538	137	60	48	32	......
20	......	......	......	......	810	1410	612	120	60	54	54	......
21	......	......	......	......	677	1370	506	137	60	48	70	......
22	......	......	......	......	622	1470	522	120	60	44	70	......
23	......	......	......	......	580	1510	458	125	60	48	48	......
24	......	......	......	......	531	1450	448	148	54	44	34	......
25	......	......	......	......	602	1510	420	137	54	48	54	......
26	......	......	......	......	505	1430	432	137	54	48	34	......
27	......	......	......	......	475	1390	393	148	60	54	30	......
28	......	......	......	......	465	1350	379	137	60	44	28	......
29	......	......	......	......	485	1410	342	137	60	48	38	......
30	......	......	......	......	531	1320	367	126	54	54	48	......
31	......	......	......	......	542	......	330	126	......	60	......	......
Total	......	......	......	......	14149	40990	23713	5084	2318	1561	1448	......
Mean....	......	......	......	......	456	1370	765	164	77.3	50.4	48.3	......
Acre-ft.	......	......	......	......	28000	81500	47000	10100	4600	3100	2870	......

Discharge of Elk River at Hinman Park for 1918.

Drainage Area, 61 Square Miles. Altitude, 7,800 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	514	438	170	60	68	......	......
2	......	......	......	......	......	514	438	182	60	68	......	......
3	......	......	......	......	......	590	457	170	60	68	......	......
4	......	......	......	......	......	630	438	159	75	126	......	......
5	......	......	......	......	......	722	400	159	75	182	......	......
6	......	......	......	......	......	774	362	159	75	182	......	......
7	......	......	......	......	......	830	344	159	75	218	......	......
8	......	......	......	......	......	890	326	159	68	230	......	......
9	......	......	......	......	......	1030	326	159	54	290	......	......
10	......	......	......	......	......	1030	362	159	68	290	......	......
11	......	......	......	......	......	1200	381	170	85	230	......	......
12	......	......	......	......	......	1480	326	159	95	182	......	......
13	......	......	......	......	......	1380	326	170	68	159	......	......
14	......	......	......	......	......	1570	400	159	68	159	......	......
15	......	......	......	......	......	1480	290	137	68	159	......	......
16	......	......	......	......	......	1480	258	148	68	159	......	......
17	......	......	......	......	......	1250	258	137	75	137	......	......
18	......	......	......	......	......	1200	206	170	85	159	......	......
19	......	......	......	......	......	1110	206	137	68	......	......	......
20	......	......	......	......	......	1150	182	137	60	......	......	......
21	......	......	......	......	......	1070	230	126	75	......	......	......
22	......	......	......	......	......	890	182	95	75	......	......	......
23	......	......	......	......	......	830	182	75	68	......	......	......
24	......	......	......	......	......	860	159	137	68	......	......	......
25	......	......	......	......	......	722	182	95	68	......	......	......
26	......	......	......	......	674	722	182	95	68	......	......	......
27	......	......	......	......	630	674	182	95	68	......	......	......
28	......	......	......	......	590	630	182	85	75	......	......	......
29	......	......	......	......	590	552	182	75	68	......	......	......
30	......	......	......	......	552	400	170	68	60	......	......	......
31	......	......	......	......	514	......	170	75	......	......	......	......
Total	......	......	......	....	3550	28174	8727	4180	2103	3066	......	......
Mean....	......	......	......	......	592	939	282	135	70.1	170	......	......
Max.	......	......	......	......	......	1570	457	182	95	......	......	......
Min.......	......	......	......	......	......	400	159	68	54	......	......	......
Acre-ft.	......	......	......	......	7050	55900	17300	8300	4170	6070	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Elk River Near Clark for 1917.
Drainage Area, 206 Square Miles. Altitude, 7,300 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	468	1880	2920	750	150	82	74	......
2	......	......	......	......	382	1930	2740	660	130	90	68	......
3	......	......	......	......	341	1830	2610	600	130	68	68	......
4	......	......	......	......	327	2060	2520	620	130	74	74	......
5	......	......	......	......	354	1960	2340	550	140	82	82	......
6	......	......	......	......	341	2030	2430	425	155	82	82	......
7	......	......	......	......	382	2170	2300	310	148	82	82	......
8	......	......	......	......	424	2390	2260	300	110	74	74	......
9	......	......	......	......	604	2570	2340	330	120	68	68	......
10	......	......	......	......	876	2710	2180	300	110	68	68	......
11	......	......	......	......	758	2580	2070	260	125	68	68	......
12	......	......	......	......	800	2710	1870	240	150	68	68	......
13	......	......	......	......	976	2540	1710	250	180	62	62	......
14	......	......	......	473	1200	2460	1640	250	180	62	62	......
15	......	......	......	323	1530	2580	1570	250	160	68	68	......
16	......	......	......	196	1740	2710	1360	250	150	74	74	......
17	......	......	......	149	1790	2600	1220	240	130	58	74	......
18	......	......	......	141	1920	2580	1110	250	125	68	52	......
19	......	......	......	135	1940	2680	1110	240	120	68	52	......
20	......	......	......	128	1870	2500	1010	215	125	68	74	......
21	......	......	......	179	1590	2430	1040	200	110	58	90	......
22	......	......	......	238	1460	2610	1080	220	130	54	90	......
23	......	......	......	264	1360	2680	950	200	150	62	68	......
24	......	......	......	414	1240	2580	925	180	110	74	54	......
25	......	......	......	452	1410	2680	878	170	125	68	74	......
26	......	......	......	572	1180	2540	893	175	125	68	54	......
27	......	......	......	546	1110	2460	812	180	90	68	50	......
28	......	......	......	388	1090	2390	784	160	90	68	48	......
29	......	......	......	323	1140	2500	706	150	90	68	58	......
30	......	......	......	264	1240	2350	757	150	105	82	68	......
31	......	......	......	......	1270	......	682	160	......	90	......	......
Total	......	......	......	5185	33113	72690	48817	9235	3893	2194	2048	......
Mean	......	......	......	305	1070	2420	1570	298	130	70.8	68.3	......
Acre-ft.	......	......	......	10300	65800	144000	96500	18300	7730	4350	4060	......

Discharge of Elk River Near Clark for 1918.
Drainage Area, 206 Square Miles. Altitude, 7,300 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	1620	1880	280	65	......	......	......
2	......	......	......	......	......	1620	1560	270	65	......	......	......
3	......	......	......	......	......	1770	776	270	65	......	......	......
4	......	......	......	......	......	1170	810	260	82	......	......	......
5	......	......	......	......	......	1670	776	250	82	......	......	......
6	......	......	......	......	......	1670	595	240	82	......	......	......
7	......	......	......	......	......	1170	595	230	82	......	......	......
8	......	......	......	......	......	1410	711	220	72	......	......	......
9	......	......	......	......	......	998	544	210	64	......	......	......
10	......	......	......	......	......	2570	498	200	80	......	......	......
11	......	......	......	......	......	2740	544	200	90	......	......	......
12	......	......	......	......	......	2740	651	180	100	......	......	......
13	......	......	......	......	920	2800	776	190	73	......	......	......
14	......	......	......	......	1210	2620	544	175	73	......	......	......
15	......	......	......	......	1670	2620	498	150	73	......	......	......
16	......	......	......	......	1720	2680	455	160	73	......	......	......
17	......	......	......	......	1560	2460	498	148	80	......	......	......
18	......	......	......	......	1460	2570	544	180	90	......	......	......
19	......	......	......	......	1460	2460	338	148	73	......	......	......
20	......	......	......	......	1510	2080	394	146	65	......	......	......
21	......	......	......	......	1460	2030	434	137	80	......	......	......
22	......	......	......	......	1620	2080	414	105	80	......	......	......
23	......	......	......	......	1210	2030	498	85	73	......	......	......
24	......	......	......	......	1980	2030	455	145	75	......	......	......
25	......	......	......	......	1880	1980	455	102	75	......	......	......
26	......	......	......	......	1820	2030	414	102	75	......	......	......
27	......	......	......	......	1720	1980	338	102	75	......	......	......
28	......	......	......	......	1670	1880	338	88	85	......	......	......
29	......	......	......	......	1670	1770	320	80	80	......	......	......
30	......	......	......	......	1410	1670	320	75	75	......	......	......
31	......	......	......	......	998	......	305	80	......	......	......	......
Total	......	......	......	......	28948	60918	18278	5208	2302	......	......	......
Mean	......	......	......	......	1520	2030	590	168	76.7	......	......	......
Max.	......	......	......	......	......	2800	1880	280	100	......	......	......
Min.	......	......	......	......	......	998	305	75	64	......	......	......
Acre-ft.	......	......	......	......	57300	121000	36300	10300	4560	......	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Elk River Near Trull for 1917.
Drainage Area, 415 Square Miles. Altitude, 6,650 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	1030	2990	3600	934	152	112	104	88
2	......	......	......	......	840	3050	3370	750	130	120	98	120
3	......	......	......	......	750	2890	3210	662	130	98	98	98
4	......	......	......	......	720	3260	3100	691	130	112	104	88
5	......	......	......	......	780	3100	2890	662	112	98	112	82
6	......	......	......	......	750	3210	2990	606	152	88	112	88
7	......	......	......	......	840	3430	2840	477	140	84	112	88
8	......	......	......	......	934	3770	2790	389	112	92	104	88
9	......	......	......	......	1330	4060	2890	432	120	98	98	88
10	......	......	......	......	1930	4280	2690	410	112	88	98	88
11	......	......	......	......	1670	4060	2550	348	120	92	98	98
12	......	......	......	......	1760	4280	2300	290	152	88	98	98
13	......	......	......	......	2150	4000	2110	309	178	92	92	88
14	......	......	......	1670	2640	3890	2020	290	178	104	98	98
15	......	......	......	1140	3370	4060	1930	290	152	88	98	98
16	......	......	......	691	3830	4280	1670	309	152	92	104	92
17	......	......	......	526	3940	4110	1500	272	130	88	104	88
18	......	......	......	500	4230	4060	1370	309	130	98	82	104
19	......	......	......	477	4280	4230	1870	290	120	98	82	88
20	......	......	......	454	4170	3940	1250	272	130	98	104	84
21	......	......	......	634	3490	3830	1290	238	104	88	120	80
22	......	......	......	840	3210	4110	1330	272	130	84	120	84
23	......	......	......	934	2990	4230	1170	238	152	92	98	92
24	......	......	......	1460	2740	4060	1140	207	112	104	104	84
25	......	......	......	1630	3100	4230	1070	178	130	98	104	88
26	......	......	......	2020	2600	4000	1100	222	120	98	84	92
27	......	......	......	1930	2450	3890	1000	222	98	98	80	88
28	......	......	......	1370	2400	3770	966	178	98	98	78	92
29	......	......	......	1140	2500	3940	870	152	98	98	88	98
30	......	......	......	934	2740	3710	934	152	112	112	98	104
31	......	......	......	......	2790	......	840	164	......	120	......	104
Total	......	......	......	18350	72954	114720	60151	11211	3886	3018	2948	2858
Mean	......	......	......	1080	2350	3820	1940	362	130	97.4	98.9	92.2
Max.	......	......	......	......	4280	4280	3600	934	178	120	120	......
Min.	......	......	......	......	720	2890	840	152	98	84	78	......
Acre-ft.	......	......	......	36400	144000	227000	119000	22300	7740	5990	5880	5670

Discharge of Elk River Near Trull for 1918.
Drainage Area, 415 Square Miles. Altitude, 6,650 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	104	104	88	192	780	1640	1050	164	76	120	254	......
2	104	104	92	238	1500	1420	960	164	78	120	238	......
3	104	104	98	190	1590	1590	960	164	78	477	254	......
4	112	104	98	222	2180	1730	990	178	84	207	254	......
5	112	104	104	222	2290	2070	810	164	78	1120	254	......
6	112	104	104	348	2520	2830	780	164	80	1080	254	......
7	112	98	104	290	2760	2890	750	178	80	960	207	......
8	112	98	104	410	2760	2460	624	164	84	960	309	......
9	112	98	112	526	2830	3340	606	152	84	900	309	......
10	112	98	112	810	2640	3100	624	164	78	870	254	......
11	112	98	112	930	2520	3900	810	152	82	900	222	......
12	112	98	207	990	1770	4300	980	140	78	870	368	......
13	112	98	192	990	1680	4600	990	120	78	870	368	......
14	112	84	164	1050	1680	4400	930	98	78	606	348	......
15	112	84	140	930	1730	5000	840	92	76	254	272	......
16	112	84	140	780	2130	4800	990	88	76	152	309	......
17	112	84	130	691	2130	4600	840	84	76	130	272	......
18	112	84	120	662	1970	4400	720	84	78	130	254	......
19	112	84	140	526	1870	4000	552	84	74	130	254	......
20	120	84	140	410	2020	3900	500	84	76	152	272	......
21	120	84	207	477	1820	3610	500	84	78	164	222	......
22	112	88	272	606	2020	3180	526	82	78	164	207	......
23	112	88	328	750	2240	2760	476	82	84	164	178	......
24	112	88	222	840	2640	2460	368	76	92	178	164	......
25	112	88	192	870	2700	2240	178	84	104	178	178	......
26	112	88	192	990	2830	2130	178	82	104	207	130	......
27	104	88	152	990	2240	1640	192	78	104	207	120	......
28	104	88	192	1110	2020	1460	205	78	120	238	112	......
29	104	......	164	691	1920	1380	152	80	112	178	98	......
30	104	......	164	579	1920	1110	112	80	112	254	92	......
31	98	......	164	......	2070	......	140	78	......	192	......	......
Total	3418	2598	4750	19310	65770	88940	19283	3566	2560	13132	7027	......
Mean	110	92.8	153	644	2120	2960	622	115	85.3	424	234	......
Max.	120	104	328	1110	2830	5000	1050	178	120	1120	368	......
Min.	98	84	88	190	780	1110	112	76	76	120	92	......
Acre-ft.	6760	5150	9410	38300	130000	176000	38200	7070	5080	26100	13900	......

Unless otherwise noted, all discharges are in cubic feet per second.

BIG CREEK NEAR STEAMBOAT SPRINGS—AT MOUTH

Location.—At foot bridge, 300 feet above mouth.

Records Available.—May 11 to November 30, 1918.

Drainage Area.—41 square miles.

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge Measurements.—Made from foot bridge at Purce's Ranch.

Accuracy.—Conditions are favorable for accurate results.

MAD CREEK NEAR STEAMBOAT SPRINGS

Location.—At highway bridge on road to Hahn's Peak, 6 miles from Steamboat Springs.

Records Available.—July 1, 1912, to November 30, 1917.

Drainage Area.—40 square miles.

Gage.—Vertical staff.

Channel.—Rough, but permanent.

Discharge Measurements.—Made from bridge.

Winter Flow.—No data, as records were discontinued.

Discharge of Big Creek Near Steamboat Springs for 1918.
Drainage Area, 41 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	115	115	21	8	18	12	......
2	......	......	......	......	......	115	102	23	10	18	15	......
3	......	......	......	......	......	165	99	21	12	21	15	......
4	......	......	......	......	......	165	99	18	12	21	25	......
5	......	......	......	......	......	205	91	19	12	135	15	......
6	......	......	......	......	......	240	91	25	12	70	18	......
7	......	......	......	......	......	319	84	21	12	92	18	......
8	......	......	......	......	......	293	70	15	7	40	25	......
9	......	......	......	......	......	332	70	18	12	34	18	......
10	......	......	......	......	155	345	115	16	18	45	22	......
11	......	......	......	......	137	422	125	18	12	34	22	......
12	......	......	......	......	118	395	91	18	12	34	18	......
13	......	......	......	......	99	438	91	16	12	25	12	......
14	......	......	......	......	115	469	77	15	10	25	15	......
15	......	......	......	......	145	469	73	18	7	21	15	......
16	......	......	......	......	165	422	70	15	12	18	15	......
17	......	......	......	......	165	453	63	12	18	18	15	......
18	......	......	......	......	145	422	63	12	15	18	25	......
19	......	......	......	......	135	376	51	12	12	18	57	......
20	......	......	......	......	145	438	47	12	15	18	34	......
21	......	......	......	......	135	360	47	12	12	22	30	......
22	......	......	......	......	145	324	42	12	21	25	22	......
23	......	......	......	......	175	306	36	10	25	25	63	......
24	......	......	......	......	205	345	36	10	21	25	155	......
25	......	......	......	......	195	267	47	10	18	15	70	......
26	......	......	......	......	185	267	39	10	18	7	57	......
27	......	......	......	......	175	215	31	10	18	12	40	......
28	......	......	......	......	175	155	25	10	18	30	40	......
29	......	......	......	......	159	145	25	8	18	22	34	......
30	......	......	......	......	169	135	25	7	18	18	30	......
31	......	......	......	......	125	......	23	7	......	25	......	......
Total	......	......	......	......	3367	9117	2063	451	427	949	952	......
Mean	......	......	......	......	153	304	66.5	14.5	14.2	30.6	31.7	......
Max.	......	......	......	......	......	469	125	25	25	135	155	......
Min.	......	......	......	......	......	115	23	7	7	7	12	......
Acre-ft.	......	......	......	......	6680	18100	4090	892	845	1880	1890	......

Discharge of Mad Creek near Steamboat Springs for 1917
Drainage Area, 40 Square Miles. Altitude, 6,740 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	89	78	257	1980	143	17	11	9	......
2	......	......	......	89	67	257	1640	115	17	11	9	......
3	......	......	......	89	67	295	1380	115	17	11	9	......
4	......	......	......	89	67	338	1380	102	25	11	9	......
5	......	......	......	89	67	410	1150	102	30	11	9	......
6	......	......	......	89	78	438	1020	102	17	11	9	......
7	......	......	......	78	89	498	860	78	17	11	9	......
8	......	......	......	89	102	605	770	78	11	11	9	......
9	......	......	......	78	102	605	728	78	11	9	9	......
10	......	......	......	78	115	645	568	58	11	9	9	......
11	......	......	......	78	129	815	530	58	11	9	9	......
12	......	......	......	78	158	1020	530	58	11	9	9	......
13	......	......	......	58	173	860	568	58	11	9	9	......
14	......	......	......	58	173	860	530	58	11	9	9	......
15	......	......	......	58	189	960	568	58	11	9	9	......
16	......	......	......	58	205	815	568	42	11	9	11	......
17	......	......	......	58	239	910	530	42	11	9	11	......
18	......	......	......	78	257	960	498	42	11	9	11	......
19	......	......	......	78	275	1150	498	58	11	9	11	......
20	......	......	......	78	385	1220	295	42	11	9	11	......
21	......	......	......	78	385	1220	239	58	11	9	11	......
22	......	......	......	89	338	1220	239	58	11	9	11	......
23	......	......	......	89	338	1220	239	42	11	9	11	......
24	......	......	......	89	338	1300	205	25	11	9	11	......
25	......	......	......	89	315	1080	205	42	11	9	11	......
26	......	......	......	89	275	1300	205	42	11	9	11	......
27	......	......	......	89	239	1460	205	30	11	9	11	......
28	......	......	......	78	239	1640	173	30	11	9	11	......
29	......	......	......	78	239	1720	173	21	11	9	11	......
30	......	......	......	78	239	1890	143	21	11	9	11	......
31	......	......	......	......	239	......	143	17	11	9	......	......
Total	......	......	......	2383	6199	27968	18760	1873	393	295	290	......
Mean	......	......	......	79.4	200	932	605	60.4	13.1	9.52	9.67	......
Max	......	......	......	89	385	1890	1980	143	30	11	11	......
Min	......	......	......	58	67	257	143	17	11	9	9	......
Acre-ft.	......	......	......	4720	12300	55500	37200	3710	780	585	575	......

Unless otherwise noted, all discharges are in cubic feet per second.

MIDDLE FORK OF LITTLE SNAKE RIVER AT GARDNER'S RANCH

Location.—At Gardner's ranch, in Sec. 21, T. 12 N., R. 86 W., on the county road bridge, 10 miles above Battle Creek.

Records Available.—May 8, 1916, to November 12, 1918.

Drainage Area.—152 square miles.

Gage.—Bristol automatic gage.

Channel.—Practically permanent.

Discharge Measurements.—From bridge.

Co-operation.—The State Engineer maintains the station in co-operation with the Elk River Irrigation & Construction Co.

SOUTH FORK OF LITTLE SNAKE RIVER AT GARDNER'S RANCH

Location.—At Gardner's ranch, in Sec. 28, T. 12 N., R. 86 W., 10 miles above Battle Creek. No important tributary between the station and the mouth.

Records Available.—May 8, 1916, to October 30, 1918.

Drainage Area.—46 square miles.

Gage.—Bristol automatic gage.

Channel.—Practically permanent.

Discharge Measurements.—From bridge.

Diversions.—There are decrees for diversions of 8 second-feet from the South Fork.

Co-operation.—The State Engineer maintains the station in co-operation with the Elk River Irrigation & Construction Co.

LITTLE SNAKE RIVER NEAR DIXON, WYO.

Location.—One mile west of Dixon, Wyo., in Sec. 6, T. 12 N., R. 90 W. Nearest tributaries are Cottonwood Creek, which enters a short distance east of Dixon, and Willow Creek, which enters a mile or less downstream.

Records Available.—May 27, 1910, to November 24, 1918.

Drainage Area.—1,294 square miles.

Gage.—Chain gage.

Channel.—Slightly shifting during high water.

Discharge of Middle Fork Little Snake River at Gardner's Ranch for 1917.

Drainage Area, 152 Square Miles. Altitude, 7,000 Feet Above Sea Level

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	......	820	69	16	14	......	......
2	......	......	......	......	......	......	723	59	14	20	......	......
3	......	......	......	......	......	......	680	59	14	18	......	......
4	......	......	......	......	......	......	541	50	14	16	......	......
5	......	......	......	......	......	......	541	50	14	16	......	......
6	......	......	......	......	......	......	470	46	16	14	......	......
7	......	......	......	......	......	......	395	42	18	14	......	......
8	......	......	......	......	......	......	315	38	18	14	......	......
9	......	......	......	......	......	......	295	46	16	13	......	......
10	......	......	......	......	......	......	275	38	14	12	......	......
11	......	......	......	......	......	......	257	42	16	11	......	......
12	......	......	......	......	......	......	240	42	26	14	......	......
13	......	......	......	......	......	......	225	38	16	14	......	......
14	......	......	......	......	......	......	205	38	20	14	......	......
15	......	......	......	......	......	......	187	35	18	14	......	......
16	......	......	......	......	......	......	170	32	16	......	......	......
17	......	......	......	108	1000	385	50	10	14	20	......	......
18	......	......	......	......	......	1840	133	29	12	......	......	......
19	......	......	......	......	......	1640	120	26	14	......	......	......
20	......	......	......	......	......	1550	129	23	16	......	......	......
21	......	......	......	......	......	1580	111	23	18	......	......	......
22	......	......	......	......	......	1840	103	20	18	......	......	......
23	......	......	......	......	......	1840	95	20	16	......	......	......
24	......	......	......	......	......	1810	95	20	14	......	......	......
25	......	......	......	......	......	1580	103	18	14	......	......	......
26	......	......	......	......	......	1440	95	18	16	......	......	......
27	......	......	......	......	......	1260	95	26	18	......	......	......
28	......	......	......	......	......	1100	75	23	18	......	......	......
29	......	......	......	......	......	1070	88	20	16	......	......	......
30	......	......	......	......	......	1020	88	18	16	......	......	......
31	......	......	......	......	......	......	81	18	......	......	......	......
Total	......	......	......	......	......	19570	7850	1058	484	218	......	......
Mean	......	......	......	......	......	1510	253	34.1	16.1	14.5	......	......
Max	......	......	......	......	......	......	820	69	20	......	......	......
Min	......	......	......	......	......	......	75	18	12	......	......	......
Acre-ft.	......	......	......	......	......	38900	15600	2100	958	431	......	......

Discharge of Middle Fork Little Snake River at Gardner's Ranch for 1918.

Drainage Area, 152 Square Miles. Altitude, 7,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	125	850	108	9	8	28	33	......
2	......	......	......	......	235	850	92	9	9	28	28	......
3	......	......	......	......	289	850	100	10	9	33	33	......
4	......	......	......	......	420	850	108	10	9	38	24	......
5	......	......	......	......	546	850	125	9	12	56	28	......
6	......	......	......	......	825	775	108	10	12	28	33	......
7	......	......	......	28	1020	825	92	8	12	24	24	......
8	......	......	......	28	950	775	77	9	10	20	50	......
9	......	......	......	50	900	800	70	9	14	17	50	......
10	......	......	......	63	850	775	84	9	12	38	20	......
11	......	......	......	77	800	775	108	10	10	24	17	......
12	......	......	......	116	750	775	84	17	10	20	17	......
13	......	......	......	135	702	656	84	20	12	24	......	......
14	......	......	......	135	612	612	63	14	14	17	......	......
15	......	......	......	108	950	512	63	14	10	17	......	......
16	......	......	......	108	1000	438	50	12	12	14	......	......
17	......	......	......	108	1000	385	50	10	14	20	......	......
18	......	......	......	108	1050	351	50	10	12	24	......	......
19	......	......	......	108	900	304	50	10	12	28	......	......
20	......	......	......	108	900	351	38	9	12	24	......	......
21	......	......	......	108	825	304	38	8	14	17	......	......
22	......	......	......	108	850	261	28	9	10	26	......	......
23	......	......	......	108	950	261	24	10	10	28	......	......
24	......	......	......	108	1020	125	20	12	50	24	......	......
25	......	......	......	100	1000	125	38	10	50	14	......	......
26	......	......	......	116	950	135	38	6	28	17	......	......
27	......	......	......	108	850	145	28	10	28	14	......	......
28	......	......	......	92	850	165	17	8	28	70	......	......
29	......	......	......	92	850	125	12	7	28	44	......	......
30	......	......	......	100	850	125	9	6	28	38	......	......
31	......	......	......	......	850	......	14	7	......	33	......	......
Total	......	......	......	2320	24669	15130	1870	311	499	847	357	......
Mean	......	......	......	96.7	796	504	60.3	10.0	16.6	27.3	29.8	......
Max	......	......	......	......	1050	850	125	20	50	70	......	......
Min	......	......	......	......	125	125	9	6	8	14	......	......
Acre-ft.	......	......	......	4600	48900	30000	3710	615	988	1680	709	....

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of South Fork Little Snake River at Gardner's Ranch for 1917.
Drainage Area, 46 Square Miles. Altitude, 7,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	......	79	13.0	3.4	6.5	......	......
2	......	......	......	......	......	......	63	10.5	2.9	6.5	......	......
3	......	......	......	......	......	......	63	10.5	4.2	6.5	......	......
4	......	......	......	......	......	......	62	10.5	4.2	6.5	......	......
5	......	......	......	......	......	......	60	10.5	6.5	5.0	......	......
6	......	......	......	......	......	......	58	8.0	4.2	5.0	......	......
7	......	......	......	......	......	......	55	8.0	5.0	6.5	......	......
8	......	......	......	......	......	......	52	8.0	5.0	5.0	......	......
9	......	......	......	......	......	......	48	6.5	4.2	5.0	......	......
10	......	......	......	......	......	......	44	8.0	4.2	5.0	......	......
11	......	......	......	......	......	......	40	8.0	4.2	5.0	......	......
12	......	......	......	......	......	......	37	8.0	4.2	5.0	......	......
13	......	......	......	......	......	......	35	8.0	4.2	5.0	......	......
14	......	......	......	......	......	......	32	8.0	4.2	5.0	......	......
15	......	......	......	......	......	......	28	10.5	4.2	5.0	......	......
16	......	......	......	......	......	......	25	8.0	4.2	5.0	......	......
17	......	......	......	......	......	185	22	10.5	4.2	5.0	......	......
18	......	......	......	......	......	174	20	8.0	4.2	5.0	......	......
19	......	......	......	......	......	164	16	6.5	5.0	5.0	......	......
20	......	......	......	......	......	164	13	8.0	5.0	5.0	......	......
21	......	......	......	......	......	154	13	8.0	6.5	5.0	......	......
22	......	......	......	......	......	146	16	6.5	5.0	5.0	......	......
23	......	......	......	......	......	136	13	4.2	5.0	5.0	......	......
24	......	......	......	......	......	136	13	4.2	5.0	5.0	......	......
25	......	......	......	......	......	127	13	3.4	6.5	5.0	......	......
26	......	......	......	......	......	119	13	3.4	8.0	5.0	......	......
27	......	......	......	......	......	111	13	6.5	6.5	5.0	......	......
28	......	......	......	......	......	111	13	10.5	8.0	5.0	......	......
29	......	......	......	......	......	95	13	10.5	8.0	5.0	......	......
30	......	......	......	......	......	79	13	6.5	8.0	5.0	......	......
31	......	......	......	......	......	......	13	4.2	......	5.0	......	......
Total	......	......	......	......	......	1901	998	244.9	153.9	162.5	......	......
Mean	......	......	......	......	......	136	32.2	7.9	5.13	5.24	......	......
Max	......	......	......	......	......	......	79	13	8	......	......	......
Min	......	......	......	......	......	......	13	3.4	2.9	......	......	......
Acre-ft.	......	......	......	......	......	3770	1980	486	305	322	......	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of South Fork Little Snake River at Gardner's Ranch for 1918.
Drainage Area, 46 Square Miles. Altitude, 7,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	33	68.0	5.0	1.5	3.5	5.0	......	......
2	......	......	......	......	50	66.0	3.5	1.5	2.0	1.7	......	......
3	......	......	......	......	62	64.0	2.0	1.5	1.7	1.7	......	......
4	......	......	......	......	75	62.0	3.5	1.5	1.7	1.7	......	......
5	......	......	......	......	154	68.0	3.5	2.0	1.7	3.5	......	......
6	......	......	......	......	142	68.0	3.5	2.0	1.5	3.5	......	......
7	......	......	......	......	130	68.0	3.5	2.0	2.0	1.7	......	......
8	......	......	......	......	130	62.0	2.0	2.0	3.5	1.7	......	......
9	......	......	......	10.0	119	56.0	5.0	2.0	2.0	3.5	......	......
10	......	......	......	18.0	99	38.0	10.0	1.7	3.5	3.5	......	......
11	......	......	......	44.0	90	28.0	7.5	1.5	1.7	5.0	......	......
12	......	......	......	50.0	82	28.0	5.0	1.7	1.7	2.0	......	......
13	......	......	......	38.0	75	28.0	5.0	3.5	1.5	14.0	......	......
14	......	......	......	28.0	90	23.0	3.5	2.0	2.0	3.5	......	......
15	......	......	......	18.0	108	18.0	2.0	2.0	2.0	5.0	......	......
16	......	......	......	7.5	108	14.0	5.0	2.0	2.0	1.7	......	......
17	......	......	......	2.0	99	10.0	1.7	2.0	1.7	3.5	......	......
18	......	......	......	3.5	108	10.0	2.0	2.0	1.7	3.5	......	......
19	......	......	......	7 5	82	7.5	2.0	1.7	1.5	9.0	......	......
20	......	......	......	7.5	75	7.5	2.0	1.5	1.7	7.5	......	......
21	......	......	......	1.7	90	7.5	2.0	1.5	3.5	5.0	......	......
22	......	......	......	18 0	75	10.0	2.0	1.5	2.0	5.0	......	......
23	......	......	......	5.0	82	10.0	1.5	1.7	3.5	5.0	......	......
24	......	......	......	10.0	90	12.0	1.5	1.7	5.0	2.0	......	......
25	......	......	......	18.0	90	12.0	1.5	1.7	7.5	6.0	......	......
26	......	......	......	18.0	90	12.0	1.5	1.7	5.0	5.0	......	......
27	......	......	......	18.0	82	10.0	3.5	2.0	7.5	20.0	......	......
28	......	......	......	5.0	79	10.0	3.5	2.0	10.0	5.0	......	......
29	......	......	......	2.0	76	7.5	1.5	1.7	14.0	3.5	......	......
30	......	......	......	7.5	73	7.5	2.0	1.7	7.5	10.0	......	......
31	......	......	......	......	70	......	2.0	2.0	......	28.0	......	......
Total	......	......	......	337.2	2808	892.5	99.7	56.8	106.1	176.7	......	......
Mean	......	......	......	15.3	90.6	29.8	3.22	1.83	3.54	5.70	......	......
Max	......	......	......	......	154	68	10	3.5	14	28	......	......
Min	......	......	......	......	33	7.5	1.5	1.5	1.5	1.7	......	......
Acre-ft.	......	......	......	667	5570	1770	204	113	211	350	......	......

Discharge of Little Snake River near Dixon, Wyo., for 1917.
Drainage Area, 1,294 Square Miles. Altitude, 6,300 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	1160	980	3410	2850	432	46	85	140	140
2	......	......	......	1160	1070	3100	2600	332	38	70	140	......
3	......	......	......	1100	920	3590	2320	332	46	85	120	......
4	......	......	......	1040	980	3950	2090	284	38	100	120	......
5	......	......	......	950	920	3820	2170	284	58	100	140	......
6	......	......	......	920	760	3370	2090	236	70	70	140	......
7	......	......	......	760	920	3410	1900	188	70	70	140	......
8	......	......	......	1370	810	3680	1830	140	70	85	140	......
9	......	......	......	1190	1040	4450	1760	140	58	100	140	......
10	......	......	......	980	1260	4990	1650	100	46	85	100	......
11	......	......	......	1070	1720	4990	1490	120	38	100	120	......
12	......	......	......	1100	2120	4490	1360	100	46	100	140	......
13	......	......	......	1160	2770	4220	1200	100	70	100	120	......
14	......	......	......	1070	4090	4130	1110	100	85	100	140	......
15	......	......	......	920	4270	4360	960	70	100	100	188	......
16	......	......	......	665	4540	4540	843	100	100	100	140	......
17	......	......	......	687	4990	4630	814	100	70	100	140	......
18	......	......	......	665	5170	4720	698	70	70	85	100	......
19	......	......	......	642	5210	4630	640	85	70	100	100	......
20	......	......	......	507	5260	4490	640	70	70	100	120	......
21	......	......	......	665	4990	4400	562	70	46	100	140	......
22	......	......	......	1190	3860	4310	484	58	46	100	140	......
23	......	......	......	1800	3640	4270	484	46	46	100	100	......
24	......	......	......	2210	4090	4090	432	46	70	100	164	......
25	......	......	......	2210	4320	4040	484	38	70	120	188	......
26	......	......	......	2660	4000	3820	432	30	100	100	164	......
27	......	......	......	2260	3370	3590	380	46	100	100	140	......
28	......	......	......	1850	3060	3320	332	46	100	100	140	......
29	......	......	......	1160	3640	3100	332	46	100	100	140	......
30	......	......	......	835	4180	3140	510	46	85	70	140	......
31	......	......	......	......	4040	......	510	46	......	140	......	......
Total	......	......	......	35956	92990	121050	35957	3901	2022	2965	4084	......
Mean	......	......	......	1200	3000	4030	1160	126	67.4	95.6	136	......
Max	......	......	......	2660	5260	4990	2850	432	100	140	188	......
Min	......	......	......	507	760	3100	332	30	38	70	100	......
Acre-ft.	......	......	......	71400	184000	240000	71300	7750	4010	5880	8090	......

Discharge of Little Snake River near Dixon for 1918.
Drainage Area, 1,294 Square Miles. Altitude, 6,300 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	585	1110	2150	315	21.0	9.1	60	155	......
2	......	......	......	611	1550	1930	275	17.0	9.1	70	155	......
3	......	......	......	575	2020	2150	243	15.0	11.0	64	155	......
4	......	......	......	475	2570	2340	288	8.7	13.0	80	170	......
5	......	......	......	381	3260	2700	255	7.8	17.0	381	170	......
6	......	......	......	345	3500	2930	215	6.5	17.0	80	149	......
7	......	......	......	367	3950	3170	223	7.8	21.0	155	125	......
8	......	......	......	381	3670	3300	191	7.8	21.0	125	105	......
9	......	......	......	451	3780	3230	170	8.7	21.0	100	131	......
10	......	......	......	654	3230	3230	263	8.7	26.0	125	140	......
11	......	......	......	795	2570	3370	315	7.8	21.0	140	125	......
12	......	......	......	986	2120	3170	358	7.8	23.0	100	105	......
13	......	......	......	1130	1910	3130	323	5.7	21.0	100	120	......
14	......	......	......	1320	2440	2900	263	8.7	26.0	100	105	......
15	......	......	......	1070	2830	2640	191	10.0	23.0	100	131	......
16	......	......	......	709	3500	2600	161	13.0	19.0	80	120	......
17	......	......	295	681	3030	2210	170	10.0	19.0	80	125	......
18	......	......	335	575	3230	2020	161	7.8	19.0	90	149	......
19	......	......	358	500	2660	1720	131	8.7	29.0	100	125	......
20	......	......	345	451	2900	1720	105	7.8	23.0	90	140	......
21	......	......	315	485	2700	1570	100	6.5	21.0	80	149	......
22	......	......	358	550	2540	1700	94	7.8	23.0	80	131	......
23	......	......	413	585	2900	1450	84	7.8	26.0	90	131	......
24	......	......	475	575	3170	1410	80	10.0	40.0	80	96	......
25	......	......	535	766	3260	1230	70	8.7	100.0	80	......	......
26	......	......	550	778	3100	930	80	10.0	125.0	90	......	......
27	......	......	638	808	2800	737	64	10.0	100.0	90	......	......
28	......	......	638	692	2770	575	64	8.7	90.0	100	......	......
29	......	......	255	611	2510	413	64	7.8	70.0	100	......	......
30	......	......	475	709	2640	358	40	10.0	60.0	125	......	......
31	......	......	575	......	2440	......	18	8.7	......	125	......	......
Total	......	......	6560	19601	86660	62983	5369	292.3	1043.2	3260	3207	......
Mean	......	......	437	653	2790	2100	173	9.4	34.8	105	134	......
Max	......	......	......	1320	3950	3370	358	21	125	381	......	......
Min	......	......	......	345	1110	358	18	5.7	9.1	60	......	......
Acre-ft.	......	......	13000	38900	172000	125000	10600	578	2070	6460	6380	......

Unless otherwise noted, all discharges are in cubic feet per second.

SLATER FORK OF LITTLE SNAKE RIVER, AT BAXTER'S RANCH, NEAR SLATER

Location.—At Baxter's ranch, in Sec. 22, T. 11 N., R. 89 W., 10 miles south of Slater.

Records Available.—May 6, 1912, to November 21, 1918.

Drainage Area.—80 square miles.

Gage.—Bristol automatic gage and vertical staff.

Channel.—Rough, but permanent.

Discharge Measurements.—From bridge.

Diversions.—There are court decrees for diversions of 14 second-feet from Slater Creek, all below the station.

Co-operation.—The State Engineer maintains the station in co-operation with the Elk River Irrigation & Construction Co.

SAVERY CREEK NEAR SAVERY, WYO.

Location.—At bridge on road about one-half mile southeast of Savery, Wyo., and about one and one-half miles above mouth.

Records Available.—May 1, 1915, to November 17, 1916; April 5, 1918, to November 21, 1918.

Drainage Area.—Not measured.

Gage.—Vertical staff.

Channel.—Practically permanent.

Discharge Measurements.—Made from bridge at high water and by wading at low stages.

Winter Flow.—Records discontinued during the winter months.

Accuracy.—Records considered good.

MUDDY CREEK NEAR BAGGS, WYO.

Location.—At road bridge, 1¼ miles northeast of Baggs, Wyo., and about 1 mile above mouth.

Records Available.—May 1, 1915, to August 10, 1916; April 6, 1918, to November 16, 1918.

Drainage Area.—Not measured.

Gage.—Chain gage.

Channel.—Shifting.

Discharge Measurements.—Made from bridge and by wading.

Winter Flow.—Records discontinued during the winter months.

Accuracy.—Results fair.

Discharge of Slater Fork Little Snake River at Baxter's Ranch for 1917.

Drainage Area, 80 Square Miles. Altitude, 7,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	396	432	38	12	22	15	......
2	......	......	......	......	......	451	362	33	12	25	22	......
3	......	......	......	......	......	570	379	33	12	18	22	......
4	......	......	......	......	42	650	346	33	12	18	18	......
5	......	......	......	......	66	490	330	33	18	15	18	......
6	......	......	......	......	88	510	275	33	18	18	18	......
7	......	......	......	......	66	550	262	25	18	18	22	......
8	......	......	......	......	105	745	262	25	18	18	18	......
9	......	......	......	......	124	895	262	25	18	18	18	......
10	......	......	......	......	165	845	250	25	18	18	18	......
11	......	......	......	......	200	650	187	25	22	15	18	......
12	......	......	......	......	212	610	175	25	22	18	18	......
13	......	......	......	......	300	570	154	25	18	18	18	......
14	......	......	......	......	432	570	144	25	18	18	18	......
15	......	......	......	......	510	610	124	29	18	18	12	......
16	......	......	......	......	590	670	96	25	18	18	18	......
17	......	......	......	......	695	720	80	25	18	25	22	......
18	......	......	......	......	745	720	73	25	12	18	22	......
19	......	......	......	......	795	610	66	22	12	18	22	......
20	......	......	......	......	670	590	60	18	18	18	18	......
21	......	......	......	......	470	590	53	18	18	15	22	......
22	......	......	......	......	432	630	53	18	18	15	22	......
23	......	......	......	......	470	590	42	18	18	15	18	......
24	......	......	......	......	590	550	42	18	18	15	25	......
25	......	......	......	......	530	570	33	18	18	18	22	......
26	......	......	......	......	414	570	33	18	18	15	22	......
27	......	......	......	......	451	550	33	25	18	22	22	......
28	......	......	......	......	510	490	33	18	22	22	......	......
29	......	......	......	......	490	490	33	18	18	22	......	......
30	......	......	......	......	490	451	33	18	18	22	......	......
31	......	......	......	......	451	......	42	15	......	18	......	......
Total	......	......	......	......	11103	17903	4749	749	516	571	528	......
Mean....	......	......	......	......	396	597	153	24.2	17.2	18.4	19.6	......
Max.	......	......	......	......	......	895	432	38	22	25	......	......
Min.......	......	......	......	......	......	396	33	15	12	15	......	......
Acre-ft.	......	......	......	......	22000	35500	9410	1490	1020	1130	1050	......

Discharge of Slater Fork Little Snake River at Baxter's Ranch for 1918.

Drainage Area, 80 Square Miles. Altitude, 7,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	33	105	262	53	15	7	10	29	......
2	......	......	......	33	212	262	53	15	7	15	33	......
3	......	......	......	25	315	300	80	15	8	12	33	......
4	......	......	......	38	396	330	80	12	8	33	33	......
5	......	......	......	53	396	362	60	12	8	42	33	......
6	......	......	......	42	490	362	53	15	8	29	33	......
7	......	......	......	48	510	379	60	12	10	25	33	......
8	......	......	......	53	451	379	48	12	8	18	33	......
9	......	......	......	48	432	396	48	12	10	22	33	......
10	......	......	......	53	362	414	80	12	10	33	33	......
11	......	......	......	73	275	414	96	12	8	25	33	......
12	......	......	......	80	225	396	80	18	8	22	33	......
13	......	......	......	114	315	396	66	18	8	18	33	......
14	......	......	......	114	330	379	53	15	8	15	22	......
15	......	......	......	88	396	346	42	18	8	15	25	......
16	......	......	......	80	451	300	38	10	8	15	29	......
17	......	......	......	73	470	275	33	10	8	18	42	......
18	......	......	......	60	396	262	33	8	8	18	42	......
19	......	......	......	60	379	250	29	8	8	22	38	......
20	......	......	......	73	396	250	29	8	8	22	38	......
21	......	......	......	66	362	250	33	7	8	18	42	......
22	......	......	......	73	346	200	25	7	8	25	......	......
23	......	......	......	73	379	187	25	7	8	25	......	......
24	......	......	......	105	362	164	25	8	22	18	......	......
25	......	......	......	80	346	124	38	7	12	25	......	......
26	......	......	......	88	336	105	25	7	8	22	......	......
27	......	......	......	96	327	88	22	7	7	18	......	......
28	......	......	......	80	318	80	18	7	7	22	......	......
29	......	......	......	80	309	73	15	7	6	22	......	......
30	......	......	......	105	300	60	15	7	7	25	......	......
31	......	......	......	......	288	......	15	7	......	22	......	......
Total	......	......	......	2087	10975	8045	1370	335	257	671	683	......
Mean....	......	......	......	69.6	354	268	44.2	10.8	8.57	21.6	32.5	......
Max.	......	......	......	114	510	414	96	18	22	42	......	......
Min.......	......	......	......	25	105	60	15	7	6	10	......	......
Acre-ft.	......	......	......	4140	21800	15900	2720	664	510	1330	1350	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Savery Creek Near Savery, Wyo., for 1918.
Drainage Area, 354 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	202	260	18	0.6	0	24	24	......
2	......	......	......	......	202	230	18	0.6	0	24	31	......
3	......	......	......	......	463	216	18	0.6	0	24	39	......
4	......	......	......	......	260	202	31	0.2	0	49	39	......
5	......	......	......	56	230	230	18	0	0	63	39	......
6	......	......	......	87	447	202	18	0	0	24	44	......
7	......	......	......	104	509	275	9	0.2	0	31	44	......
8	......	......	......	95	509	260	9	0.2	0	28	49	......
9	......	......	......	113	509	230	9	0	0	24	49	......
10	......	......	......	131	321	230	24	0	0	31	49	......
11	......	......	......	202	260	230	131	0	0	39	56	......
12	......	......	......	260	260	230	113	0	0	49	63	......
13	......	......	......	260	260	216	95	0	0	63	63	......
14	......	......	......	321	260	188	56	0	0	49	63	......
15	......	......	......	321	321	162	44	0	1.2	28	49	......
16	......	......	......	290	445	162	44	0	1.2	24	63	......
17	......	......	......	188	321	188	39	0	1.2	18	79	......
18	......	......	......	150	321	150	39	0	2.0	24	63	......
19	......	......	......	150	321	141	39	0	3	31	63	......
20	......	......	......	113	260	95	39	0	9	39	49	......
21	......	......	......	113	260	141	35	0	9	31	31	......
22	......	......	......	122	290	150	31	0	9	31	......	......
23	......	......	......	150	321	150	31	0	18	24	......	......
24	......	......	......	150	260	95	28	0	35	18	......	......
25	......	......	......	216	260	71	24	0	39	18	......	......
26	......	......	......	230	260	87	21	0	56	21	......	......
27	......	......	......	245	245	49	18	0	63	18	......	......
28	......	......	......	202	245	31	18	0	35	24	......	......
29	......	......	......	150	230	18	9	0	39	28	......	......
30	......	......	......	202	260	18	3.5	0	39	31	......	......
31	......	......	......	......	260	......	.6	0	......	24	......	......
Total	......	......	......	4621	9572	4907	1030.1	2.4	359.6	954	1049	......
Mean	......	......	......	178	309	164	33.2	.077	12	30.8	50.0	......
Max.	......	......	......	......	509	275	131	0.6	63	63	......	......
Min.	......	......	......	......	202	18	0.6	0	0	18	......	......
Acre-ft.	......	......	......	9180	19000	9760	2040	4.73	714	1890	2080	......

Discharge of Muddy Creek Near Baggs, Wyo., for 1918.
Drainage Area, 904 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	16	22	8	43	0	98	17	......
2	......	......	......	......	16	8	10	19	0	65	0.2	......
3	......	......	......	......	13	9	9	12	0	78	0.4	......
4	......	......	......	......	12	7	10	8	0	98	0.2	......
5	......	......	......	......	24	10	9	22	0	42	0.2	......
6	......	......	......	15	33	6	9	10	0	34	0	......
7	......	......	......	16	30	6	15	11	0	28	0	......
8	......	......	......	30	33	6	12	12	0	78	0	......
9	......	......	......	43	39	7	9	9	0	118	0.2	......
10	......	......	......	42	34	8	16	8	0	88	14	......
11	......	......	......	22	25	6	100	7	0	82	0.3	......
12	......	......	......	134	30	7	142	6	0	74	0	......
13	......	......	......	52	33	6	215	6	0	90	0	......
14	......	......	......	58	39	6	108	0	0	66	0	......
15	......	......	......	45	21	16	62	0	0	28	0	......
16	......	......	......	49	30	17	33	0	0	15	0	......
17	......	......	......	28	30	14	16	0	0	28	......	......
18	......	......	......	25	30	22	16	5	0	22	......	......
19	......	......	......	30	33	24	13	43	0	11	......	......
20	......	......	......	30	16	28	8	51	0	8	......	......
21	......	......	......	33	22	240	30	28	0	5	......	......
22	......	......	......	33	16	100	16	31	0	1.3	......	......
23	......	......	......	34	18	445	22	158	0	0	......	......
24	......	......	......	33	15	290	33	153	5	0.2	......	......
25	......	......	......	39	12	100	36	15	28	0.6	......	......
26	......	......	......	43	18	36	34	6	78	1.3	......	......
27	......	......	......	12	13	33	80	0	342	0.2	......	......
28	......	......	......	13	14	19	190	0	392	0	......	......
29	......	......	......	12	16	19	240	0	288	0	......	......
30	......	......	......	14	18	16	166	0	252	21	......	......
31	......	......	......	......	21	......	80	0	......	44	......	......
Total	......	......	......	885	720	1533	1747	713	1385	1224.6	17.2	......
Mean	......	......	......	35.4	23.2	51.1	56.4	23	46.2	39.5	1.08	......
Max.	......	......	......	......	39	445	240	158	392	118	......	......
Min.	......	......	......	......	12	6	8	0	0	0	......	......
Acre-ft.	......	......	......	1760	1430	3040	3470	1410	2750	2430	34.2	......

Unless otherwise noted, all discharges are in cubic feet per second.

WILLOW CREEK AT RYAN'S RANCH, NEAR BAGGS, WYO.

Location.—In Colorado, about Sec. 26, T. 11 N., R. 90 W., 2 miles northeast of Ryan's ranch house and 22 miles southeast of Baggs, Wyo. No important tributary between the station and the mouth of Willow Creek.

Records Available.—May 4, 1912, to November 10, 1918.

Drainage Area.—Approximately 5 square miles.

Gage.—Bristol automatic gage.

Channel.—Small cobblestones, placed especially for the station.

Discharge Measurements.—Made from foot-bridge.

Co-operation.—Station maintained by the State Engineer in cooperation with the Elk River Irrigation & Construction Co.

FOUR-MILE CREEK AT RANGER STATION, NEAR BAGGS, WYO.

Location.—In Colorado, at forest ranger station near Ryan's ranch, in Sec. 9, T. 10 N., R. 90 W., 20 miles southeast of Baggs, Wyo.

Records Available.—May 1, 1912, to November 10, 1918.

Drainage Area.—Approximately 4 square miles.

Gage.—Bristol automatic gage.

Channel.—Probably permanent.

Discharge Measurements.—Made from foot-bridge.

Co-operation.—The State Engineer maintains the station in cooperation with the Elk River Irrigation & Construction Co.

WHITE RIVER NEAR MEEKER

Location.—At the Rees ranch, 3½ miles east of Meeker, in Sec. 24, T. 1 N., R. 93 W. Nearest tributary above is Curtis Creek; nearest below is Sulphur Creek. Station moved from Van Cleave's to Rees' ranch October 20, 1913.

Records Available.—May 7, 1910, to November 30, 1918. From April 12, 1904, to October 31, 1906, a station was maintained 2.5 miles below this point by the United States Geological Survey.

Drainage Area.—634 square miles.

Gage.—Automatic recording gage.

Channel.—Practically permanent.

Discharge Measurements.—Made from private road bridge.

Winter Flow.—Discharge estimates from measurements during winter months.

Diversions.—There are court decrees for diversions of 186 second-feet from White River above the station and 59 second-feet from tributaries entering above. Below there are decrees for diversions of 198 second-feet from White River.

Note.—Station moved to get above the head of the Meeker Power Canal. Diversion started during winter of 1912-1913.

1913 records prior to October 20 corrected for the diversion. Average diversion about 90 second-feet.

Discharge of Willow Creek at Ryan's Ranch for 1917.
Drainage Area, 5 Square Miles. Altitude, 8,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	54	47.0	6.2	7.5	......	......	......
2	......	......	......	......	......	62	40.0	6.2	1.2	......	......	......
3	......	......	......	......	......	67	37.0	4.8	1.0	......	......	......
4	......	......	......	......	......	64	40.0	3.8	1.0	......	......	......
5	......	......	......	......	......	57	40.0	2.8	1.0	......	......	......
6	......	......	......	......	44	54	42.0	2.8	1.0	......	......	......
7	......	......	......	......	42	62	42.0	2.8	1.0	......	......	......
8	......	......	......	......	44	76	40.0	2.8	1.0	......	......	......
9	......	......	......	......	47	86	37.0	2.8	1.0	......	......	......
10	......	......	......	......	44	67	34.0	2.8	1.0	......	......	......
11	......	......	......	......	44	60	32.0	2.8	2.2	......	......	......
12	......	......	......	......	47	54	30.0	2.8	2.2	......	......	......
13	......	......	......	......	50	54	30.0	3.8	1.2	......	......	......
14	......	......	......	......	54	62	30.0	6.2	3.8	......	......	......
15	......	......	......	......	70	76	27.0	6.2	2.8	......	......	......
16	......	......	......	......	73	78	27.0	4.8	2.8	......	......	......
17	......	......	......	......	70	88	24.0	4.8	......	......	......	......
18	......	......	......	......	73	78	24.0	7.5	......	......	......	......
19	......	......	......	......	70	76	20.0	6.2	......	......	......	......
20	......	......	......	......	64	78	20.0	4.8	......	......	......	......
21	......	......	......	......	63	78	20.0	3.8	......	......	......	......
22	......	......	......	......	62	78	20.0	2.8	......	......	......	......
23	......	......	......	......	61	78	9.8	3.8	......	......	......	......
24	......	......	......	......	60	78	7.5	4.8	......	......	......	......
25	......	......	......	......	59	64	6.2	4.8	......	......	......	......
26	......	......	......	......	58	62	7.5	7.5	......	......	......	......
27	......	......	......	......	57	57	3.8	4.8	......	......	......	......
28	......	......	......	......	60	54	3.8	2.8	......	......	......	......
29	......	......	......	......	62	57	7.5	2.8	......	......	......	......
30	......	......	......	......	62	57	7.5	3.8	......	......	......	......
31	......	......	......	......	60	......	7.5	1.5	......	......	......	......
Total	......	......	......	......	1498	2016	764.1	130.9	31.7	......	......	......
Mean	......	......	......	......	57.6	67.2	24.6	4.22	1.98	......	......	......
Max.	......	......	......	......	......	88	47	7.5	......	......	......	......
Min.	......	......	......	......	......	54	6.2	1.5	......	......	......	......
Acre-ft.	......	......	......	......	2970	4000	1510	259	62.9	......	......	......

Discharge of Willow Creek at Ryan's Ranch for 1918.
Drainage Area, 5 Square Miles. Altitude, 8,000 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	14	20	12.0	8.0	4.8	10.0	4.8	......
2	......	......	......	......	40	16	12.0	8.0	4.8	8.0	6.4	......
3	......	......	......	......	30	16	14.0	12.0	4.8	8.0	8.0	......
4	......	......	......	......	16	16	12.0	12.0	4.8	16.0	8.0	......
5	......	......	......	......	20	14	12.0	12.0	6.4	14.0	6.4	......
6	......	......	......	......	38	14	12.0	8.0	4.8	8.0	8.0	......
7	......	......	......	......	38	14	12.0	8.0	6.4	10.0	12.0	......
8	......	......	......	......	35	14	12.0	8.0	6.4	8.0	8.0	......
9	......	......	......	......	35	14	12.0	8.0	8.0	8.0	8.0	......
10	......	......	......	......	20	16	10.0	4.8	4.8	10.0	6.4	......
11	......	......	......	......	16	16	8.0	6.4	3.8	8.0	......	......
12	......	......	......	......	14	18	8.0	6.4	4.8	8.0	......	......
13	......	......	......	......	14	20	8.0	8.0	4.8	6.4	......	......
14	......	......	......	......	22	20	8.0	6.4	6.4	12.0	......	......
15	......	......	......	......	28	25	8.0	8.0	8.0	10.0	......	......
16	......	......	......	......	35	20	8.0	6.4	6.4	10.0	......	......
17	......	......	......	......	38	16	8.0	8.0	6.4	8.0	......	......
18	......	......	......	......	32	16	8.0	10.0	6.4	8.0	......	......
19	......	......	......	......	25	16	8.0	10.0	6.4	10.0	......	......
20	......	......	......	......	30	18	8.0	8.0	6.4	8.0	......	......
21	......	......	......	......	32	16	8.0	8.0	4.8	8.0	......	......
22	......	......	......	......	28	14	8.0	8.0	4.8	10.0	......	......
23	......	......	......	......	25	14	8.0	8.0	12.0	10.0	......	......
24	......	......	......	......	25	12	8.0	8.0	14.0	10.0	......	......
25	......	......	......	......	22	12	8.0	8.0	14.0	10.0	......	......
26	......	......	......	2.8	20	12	8.0	8.0	12.0	12.0	......	......
27	......	......	......	2.1	18	12	6.4	6.4	10.0	10.0	......	......
28	......	......	......	2.1	18	12	6.4	4.8	10.0	8.0	......	......
29	......	......	......	2.8	18	12	6.4	6.4	8.0	12.0	......	......
30	......	......	......	3.8	16	12	8.0	4.8	10.0	8.0	......	......
31	......	......	......	......	16	......	8.0	6.4	......	6.4	......	......
Total	......	......	......	13.6	778	467	283.2	243.2	215.4	292.8	76.0	......
Mean	......	......	......	2.72	25.1	15.6	9.14	7.85	7.18	9.45	7.60	......
Max.	......	......	......	......	40	25	14	12	14	16	......	......
Min.	......	......	......	......	14	12	6.4	4.8	3.8	6.4	......	......
Acre-ft.	......	......	......	27.0	1540	928	562	483	427	581	151	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of Four-Mile Creek at Ranger's Station for 1917.
Drainage Area, 4 Square Miles. Altitude, 7,800 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	54	23.0	0.8	0.8	4.2	2.8	......
2	......	......	......	......	......	74	15.0	0.8	0.8	4.2	2.8	......
3	......	......	......	......	......	97	9.8	0.8	0.8	2.8	2.0	......
4	......	......	......	......	......	67	9.8	0.8	0.8	2.8	1.2	......
5	......	......	......	......	......	60	7.6	0.8	0.8	2.8	1.0	......
6	......	......	......	......	32	60	5.5	0.8	0.8	2.0	0.6	......
7	......	......	......	......	38	74	5.5	0.8	0.8	2.0	1.0	......
8	......	......	......	......	43	97	5.5	0.8	0.8	2.0	0.6	......
9	......	......	......	......	43	123	4.2	0.8	0.8	2.0	4.2	......
10	......	......	......	......	54	123	2.8	0.8	0.8	2.0	4.2	......
11	......	......	......	......	48	97	4.2	0.8	0.8	2.0	2.8	......
12	......	......	......	......	38	81	4.2	0.8	1.2	2.0	......	......
13	......	......	......	......	67	81	4.2	0.8	1.2	2.0	......	......
14	......	......	......	......	81	81	4.2	0.8	2.0	2.0	......	......
15	......	......	......	......	132	81	2.8	0.8	1.2	2.0	......	......
16	......	......	......	......	106	89	2,4	0.8	1.2	2.0	......	......
17	......	......	......	......	97	89	2.1	0.8	1.2	2.8	......	......
18	......	......	......	......	97	81	1.8	0.8	2.0	2.8	......	......
19	......	......	......	......	89	81	1.4	0.8	2.8	2.8	......	......
20	......	......	......	......	74	81	1.1	0.8	4.2	2.8	......	......
21	......	......	......	......	48	81	0.7	0.8	4.2	2.8	......	......
22	......	......	......	......	43	89	0.6	0.8	5.5	2.8	......	......
23	......	......	......	......	60	74	1.2	0.6	5.5	2.8	......	......
24	......	......	......	......	81	54	1.0	1.0	2.8	2.8	......	......
25	......	......	......	......	97	54	1.0	0.6	2.8	4.2	......	......
26	......	......	......	......	81	48	0.8	0.8	2.8	4.2	......	......
27	......	......	......	......	67	43	0.8	0.8	4.2	4.2	......	......
28	......	......	......	......	74	38	0.8	0.8	5.5	5.5	......	......
29	......	......	......	......	74	38	0.8	0.8	5.5	5.5	......	......
30	......	......	......	......	74	28	0.8	0.8	4.2	5.5	......	......
31	......	......	......	......	67	......	0.8	0.8	......	5.5	......	......
Total	......	......	......	......	1805	2218	126.4	24.6	68.8	95.8	23.2	......
Mean	......	......	......	......	69.4	73.9	4.08	0.79	2.29	3,08	2.11	......
Max.	......	......	......	......	......	123	28	1.0	5.5	5.5	......	......
Min.	......	......	......	......	......	28	0.6	0.6	0.8	2.0	......	......
Acre-ft.	......	......	......	......	3580	4400	251	48.5	136	189	46	......

Discharge of Four-Mile Creek at Ranger's Station for 1918.
Drainage Area, 4 Square Miles. Altitude, 7,800 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	4.0	17.5	13.8	3.0	1.7	1.7	0.8	......
2	......	......	......	......	7.5	17.5	17.5	2.3	0.8	1.2	0.8	......
3	......	......	......	......	10.5	13.8	22.0	2.3	0.5	1.7	0.8	......
4	......	......	......	......	10.5	13.8	12.1	4.0	0.5	2.3	0.8	......
5	......	......	......	......	10.5	13.8	12.1	4.0	0.6	3.0	0.8	......
6	......	......	......	......	10.5	13.8	13.8	1.2	0.5	3.0	0.6	......
7	......	......	......	......	12.1	13.8	17.5	0.5	0.5	2.3	0.8	......
8	......	......	......	......	10.5	13.8	13.8	0.8	0.6	1.7	0.8	......
9	......	......	......	......	9.0	7.5	13.8	0.8	0.6	0.8	0.8	......
10	......	......	......	......	12.1	7.5	13.8	0.6	0.5	0.8	0.8	......
11	......	......	......	......	9.0	10.5	13.8	0.5	0.3	0.6	......	......
12	......	......	......	......	9.0	10.5	17.5	0.8	0.4	0.6	......	......
13	......	......	......	......	10.5	10.5	10.5	0.8	0.6	0.5	......	......
14	......	......	......	9.0	7.5	13.8	13.8	0.8	0.8	0.5	......	......
15	......	......	......	6.2	7.5	7.5	9.0	0.8	0.8	0.5	......	......
16	......	......	......	5.0	10.5	5.0	7.5	0.8	0.8	0.8	......	......
17	......	......	......	10.5	10.5	5.0	5.0	0.5	0.8	0.8	......	......
18	......	......	......	7.5	13.8	5.0	7.5	0.5	0.6	0.8	......	......
19	......	......	......	7.5	13.8	5.0	13.8	0.5	0.6	1.2	......	......
20	......	......	......	7.5	12.1	5.0	7.5	0.4	0.8	1.2	......	......
21	......	......	......	7.5	12.1	5.0	7.5	0.4	0.8	1.7	......	......
22	......	......	......	9.0	13.8	6.2	7.5	0.3	1.7	1.7	......	......
23	......	......	......	5.0	10.5	3.0	7.5	0.3	1.7	1.2	......	......
24	......	......	......	5.0	10.5	3.0	7.5	0.3	2.3	0.8	......	......
25	......	......	......	5.0	17.5	3.0	7.5	0.8	4.0	0.6	......	......
26	......	......	......	5.0	13.8	3.0	5.0	0.8	2.3	0.8	......	......
27	......	......	......	5.0	10.5	7.5	5.0	0.8	2.3	0.8	......	......
28	......	......	......	5.0	13.8	13.8	3.0	0.8	0.8	0.8	......	......
29	......	......	......	3.0	13.8	13.8	1.7	1.7	0.8	0.8	......	......
30	......	......	......	5.0	17.5	13.8	1.7	0.8	0.8	0.8	......	......
31	......	......	......	......	22.0	......	1.7	0.8	......	0.8	......	......
Total	......	......	......	107.7	357.2	282.7	311.7	33.7	27.2	36.8	7.80	......
Mean	......	......	......	6.34	11.5	9.42	10.1	1.09	.91	1.19	.780	......
Max.	......	......	......	......	22	17.5	22	4.0	4.0	3.0	......	......
Min.	......	......	......	......	4	3	1.7	0.3	0.3	0.5	......	......
Acre-ft.	......	......	......	214	707	560	621	67.0	54.1	73.2	15.5	......

Unless otherwise noted, all discharges are in cubic feet per second.

Discharge of White River Near Meeker for 1917.
Drainage Area, 634 Square Miles. Altitude, 6,182 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	350	640	1780	3360	850	460	460	386	350
2	......	......	......	350	640	1650	3630	890	460	460	403	373
3	......	......	......	360	640	1590	3360	850	460	460	386	403
4	......	......	......	332	640	1840	3270	710	460	460	360	360
5	......	......	......	340	570	1840	3020	640	460	460	360	360
6	......	......	......	360	510	1710	2930	570	460	460	386	360
7	......	......	......	340	605	1970	2680	605	485	460	420	386
8	......	......	......	373	605	2300	2440	640	510	460	440	403
9	......	......	......	403	640	2850	2520	605	485	460	373	420
10	......	......	340	420	710	3190	2440	605	460	460	350	400
11	......	......	340	420	710	3270	2370	570	485	460	340	400
12	......	......	340	440	710	3020	2230	605	540	485	340	380
13	......	......	340	510	745	3100	2030	640	485	510	340	390
14	......	......	340	420	1050	3190	1780	605	540	485	340	390
15	......	......	340	420	1470	3450	1590	570	540	460	350	390
16	......	......	340	373	1900	3450	1410	540	485	460	350	370
17	......	......	340	386	2100	3100	1210	570	440	440	350	350
18	......	......	340	386	2230	3190	1170	510	440	440	340	340
19	......	......	340	386	2030	3990	1130	460	485	460	340	340
20	......	......	340	386	1840	4180	1130	460	510	460	340	340
21	......	......	340	386	1590	4470	1090	510	510	440	340	360
22	......	......	340	403	1360	4660	1050	570	510	420	340	360
23	......	......	340	540	1360	4090	970	570	460	420	340	360
24	......	......	340	570	1360	3540	970	570	460	420	340	360
25	......	......	340	605	1530	3810	930	510	460	420	340	400
26	......	......	332	675	1470	3720	930	510	460	420	340	400
27	......	......	340	710	1360	3720	930	510	460	420	340	390
28	......	......	373	570	1470	3450	850	540	460	403	332	390
29	......	......	460	570	1530	3450	780	510	460	386	340	390
30	......	......	485	605	1650	3360	780	460	460	386	340	370
31	......	......	403	......	1840	......	890	403	......	403	......	370
Total	......	......	7833	13389	37505	92930	55870	18158	14350	13798	10686	11655
Mean....	......	......	356	446	1210	3100	1800	586	478	445	356	376
Max.	......	......	......	710	2230	4660	3630	890	540	510	440	420
Min.......	......	......	......	332	510	1590	780	403	440	386	332	340
Acre-ft.	......	......	15500	26500	74400	184000	111000	36000	28400	27400	21200	23100

Discharge of White River Near Meeker for 1918.
Drainage Area, 634 Square Miles. Altitude, 6,182 Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	370	325	350	460	510	1290	860	410	320	360	360	......
2	370	330	355	460	600	1190	860	380	320	360	360	......
3	365	340	365	460	740	1500	860	435	320	360	360	......
4	385	345	385	380	1020	1610	900	410	340	360	360	......
5	375	375	380	380	1240	1730	780	460	340	380	360	......
6	355	360	390	380	1390	1860	665	485	360	380	360	......
7	340	370	370	380	1390	2000	630	460	340	360	360	......
8	370	370	370	360	1340	2000	820	410	320	360	360	......
9	355	335	380	410	1390	2150	1020	410	305	360	352	......
10	320	340	380	460	1240	2600	1060	410	305	410	340	......
11	315	345	380	485	1020	2910	1100	360	305	380	360	......
12	350	385	360	570	900	3140	940	380	290	360	360	......
13	340	390	360	570	1020	3230	860	380	290	360	360	......
14	325	340	360	570	1290	3560	780	380	290	360	380	......
15	345	360	410	540	1500	3650	700	380	290	360	380	......
16	340	340	340	510	1790	3650	700	380	290	360	380	......
17	335	350	380	460	1930	3560	665	410	290	360	360	......
18	375	375	435	410	1930	3390	665	380	290	360	380	......
19	370	380	435	435	1790	2830	630	380	290	340	360	......
20	325	370	380	410	2000	2830	540	380	305	360	360	......
21	320	375	380	410	2070	2910	510	360	360	360	360	......
22	340	350	380	460	1930	2530	540	360	360	360	340	......
23	360	390	380	460	2070	2150	570	360	360	360	320	......
24	355	395	410	460	2150	2000	570	340	410	360	360	......
25	375	375	435	460	2150	1730	570	320	410	360	360	......
26	350	385	435	460	1730	1730	485	340	410	360	340	......
27	345	370	460	460	1670	1610	410	340	410	360	340	......
28	355	365	410	460	1670	1440	360	340	410	360	340	......
29	370	......	380	460	1610	1140	380	340	360	360	340	......
30	360	......	410	460	1550	1020	435	340	360	360	340	......
31	370	......	435	......	1390	......	435	320	......	360	......	......
Total	10925	10130	12080	13640	46020	68940	21300	11840	10050	11250	10692	......
Mean....	352	362	390	455	1480	2300	687	382	335	363	356	......
Max.	385	395	460	570	2150	3650	1100	485	410	410	380	......
Min.......	315	325	350	360	510	1020	360	320	290	340	320	......
Acre-ft.	21600	20100	24000	27100	91000	137000	42200	23500	19900	22300	21200	......

Unless otherwise noted, all discharges are in cubic feet per second.

WHITE RIVER NEAR RANGELY

Location.—On highway bridge, about 2 miles northwest of Rangely, in Sec. 35, T. 2 N., R. 102 W.

Nearest tributary, Douglas Creek, enters from the south about 2 miles above station.

Records Available.—April 15 to October 31, 1904; April 1 to October 31, 1905; May 19 to November 23, 1918.

Drainage Area.—3,266 square miles.

Gage.—Chain gage.

Channel—Sandy, slightly shifting.

Discharge Measurements.—Made from bridge to which gage is attached.

Accuracy.—Results are considered good.

PICEANCE CREEK NEAR WHITERIVER

Location.—On highway bridge, 21 miles west of Meeker, on main highway to Rangely.

Records Available.—May 19, 1918, to November 22, 1918.

Drainage Area.—642 square miles.

Gage.—Vertical staff graduation to one-tenth of a foot.

Channel.—Shifts slightly at all stages.

Discharge Measurements.—Made from bridge to which gage is attached.

Accuracy.—Conditions are favorable for fairly accurate results.

Discharge of White River Near Rangely for 1918.

Drainage Area, 3,266 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	1350	1100	1060	830	1060	421	......
2	......	......	......	......	......	1350	992	1220	830	1060	400	......
3	......	......	......	......	......	1260	992	1220	761	1060	400	......
4	......	......	......	......	......	1440	992	1220	742	1300	400	......
5	......	......	......	......	......	1390	1100	992	686	1060	360	......
6	......	......	......	......	......	1390	958	992	486	1300	360	......
7	......	......	......	......	......	1590	924	1140	400	1140	360	......
8	......	......	......	......	......	1760	860	1140	400	924	360	......
9	......	......	......	......	......	1920	992	992	400	860	360	......
10	......	......	......	......	......	1870	924	958	400	800	360	......
11	......	......	......	......	......	2200	1030	860	360	686	400	......
12	......	......	......	......	......	2440	1300	800	360	632	400	......
13	......	......	......	......	......	2630	1140	800	400	580	400	......
14	......	......	......	......	......	2830	860	958	400	771	380	......
15	......	......	......	......	......	3050	830	1030	400	992	442	......
16	......	......	......	......	......	3380	800	1060	400	1060	442	......
17	......	......	......	......	......	3750	714	1060	360	1060	442	......
18	......	......	......	......	......	3290	632	1140	360	1060	442	......
19	......	......	......	......	1590	3130	632	1100	360	1060	486	......
20	......	......	......	......	1490	2830	580	1060	324	580	532	......
21	......	......	......	......	1590	2560	532	1060	324	486	556	......
22	......	......	......	......	1540	2440	532	1060	742	486	580	......
23	......	......	......	......	1490	3050	532	992	958	486	580	......
24	......	......	......	......	1440	3950	632	958	992	486	......	......
25	......	......	......	......	1490	2690	606	924	1060	486	......	......
26	......	......	......	......	1700	2320	580	830	580	486	......	......
27	......	......	......	......	1700	1810	580	442	580	486	......	......
28	......	......	......	......	1540	1540	1060	632	1060	486	......	......
29	......	......	......	......	1490	1300	1060	860	1060	486	......	......
30	......	......	......	......	1390	1140	1060	924	1060	486	......	......
31	......	......	......	......	1490	......	1060	924	......	442	......	......
Total	......	......	......	......	19940	67650	26586	30408	18075	24347	9863	......
Mean	......	......	......	......	1530	2260	858	981	602	785	429	......
Max.	......	......	......	......	......	3750	1300	1220	1060	1300	......	......
Min.	......	......	......	......	......	1140	532	442	324	442	......	......
Acre-ft.	......	......	......	......	39400	134000	52800	60300	35800	48300	19600	......

Discharge of Piceance Creek Near Whiteriver for 1918.

Drainage Area, 642 Square Miles. Altitude, ... Feet Above Sea Level.

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	......	......	......	......	......	11.0	35	35	45	35	35	......
2	......	......	......	......	......	4.5	35	35	45	35	35	......
3	......	......	......	......	......	4.5	35	35	35	35	35	......
4	......	......	......	......	......	4.5	35	45	35	35	35	......
5	......	......	......	......	......	4.5	45	45	35	35	35	......
6	......	......	......	......	......	4.5	85	45	25	35	35	......
7	......	......	......	......	......	2.5	25	57	25	35	35	......
8	......	......	......	......	......	2.5	35	57	25	35	35	......
9	......	......	......	......	......	2.5	57	45	35	35	35	......
10	......	......	......	......	......	2.5	25	45	45	35	35	......
11	......	......	......	......	......	2.5	35	57	45	35	35	......
12	......	......	......	......	......	2.5	57	70	35	35	35	......
13	......	......	......	......	......	2.5	85	70	25	35	35	......
14	......	......	......	......	......	4.5	35	85	25	35	35	......
15	......	......	......	......	......	4.5	45	85	25	35	35	......
16	......	......	......	......	......	2.5	45	85	25	35	35	......
17	......	......	......	......	......	2.5	57	70	25	35	35	......
18	......	......	......	......	......	7.0	57	70	35	35	35	......
19	......	......	......	......	7	7.0	57	57	35	35	35	......
20	......	......	......	......	11	4.5	57	57	45	45	35	......
21	......	......	......	......	7	4.5	118	45	45	45	35	......
22	......	......	......	......	7	4.5	45	45	35	35	35	......
23	......	......	......	......	11	7.0	57	45	35	35	......	......
24	......	......	......	......	11	324.0	57	45	35	35	......	......
25	......	......	......	......	11	85.0	57	45	35	35	......	......
26	......	......	......	......	7	70.0	57	45	35	35	......	......
27	......	......	......	......	7	70.0	57	57	25	35	......	......
28	......	......	......	......	7	70.0	45	35	25	35	......	......
29	......	......	......	......	11	70.0	35	35	35	35	......	......
30	......	......	......	......	7	35.0	35	35	35	35	......	......
31	......	......	......	......	7	......	35	35	......	35	......	......
Total	......	......	......	......	111	810.9	1540	1617	1010	1105	770	......
Mean	......	......	......	......	8.54	27.0	49.7	52.2	33.7	35.6	35	......
Max.	......	......	......	......	......	324	118	85	45	45	......	......
Min.	......	......	......	......	......	2.5	2.5	35	25	35	......	......
Acre-ft.	......	......	......	......	220	1610	3060	3210	2010	2190	1530	......

Unless otherwise noted, all discharges are in cubic feet per second.

MONTHLY RUN-OFF

These data are taken from the files in the State Engineer's office and include all records on a few of the more prominent stations kept up by the State of Colorado and the United States Geological Survey.

Run-Off in Acre-Feet of Arkansas River at Canon City.

Drainage Area, 3,060 Square Miles. Altitude, 5,363 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1888........	24600	27750	36900	59500	88500	124300	83000	57300	36000	30750	29750	24600	622950
1889........	....	....	....	*14600	43012	*83600	35992	23437	13123	13244	18069	20674	....
1890........	19071	20150	19537	28449	96115	155393	96619	41107	*29800	....	....	....	....
1891........	26509	26330	36040	50995	121743	175977	90307	56479	28195	38350	29653	29306	709884
1892........	30506	28354	32396	31081	78307	167018	110509	*44500	25904	31805	26628	....	....
1893........	31150	29583	*34126	33798	90988	185373	65702	35339	28374	....	....	*26800	....
1894........	27372	23326	31061	37349	120476	160899	85835	43636	32767	18069	*15100	....	....
1895........	21172	20061	28955	50656	92584	113062	86888	67315	37805	31079	29720	27310	....
1896........	27929	25178	29026	33231	78434	57052	33076	24317	18601	17506	15870	29606	389826
1897........	14757	14291	17280	11938	106724	147209	67016	30575	14852	25498	30069	17518	497727
1898........	16264	18708	21382	23040	55876	144464	99679	20049	11238	13991	17980	21263	463934
1899........	19430	16764	35780	32380	118318	208050	124244	43706	13384	14039	24420	20390	670905
1900........	21905	19498	26154	43787	138424	207766	54779	16788	12571	14818	15854	18341	590685
1901........	18631	15598	13741	22189	103370	129826	48871	38755	20924	19234	16118	18843	466100
1902........	19242	18327	20870	17500	46532	28653	14102	16629	15100	19275	18167	21039	255436
1903........	19581	16643	26428	26424	29050	182330	91718	34314	20037	14126	13714	16657	491022
1904........	16241	16701	10852	21102	60807	83092	59972	44660	26412	34627	16945	17639	409050
1905........	19934	19369	24813	35653	71107	236650	67359	45661	19002	19537	23524	21193	603802
1906........	21273	19361	23544	29806	81515	144982	95536	49176	35546	39882	37376	....	....
1907........	....	....	....	....	58933	163787	198884	71800	38864	....	....	....	....
1908........	....	....	....	....	....	81251	51620	34814	13067	15277	17242	....	....
1909........	....	....	....	....	45130	171550	123540	71580	81170	38800	31300	25090	....
1910........	26440	19940	33940	48320	111630	110680	39720	29100	20530	21090	17730	18238	497255
1911........	18718	16919	23336	17070	63393	152547	134957	56356	26638	73453	32222	23009	638616
1912........	20301	16671	24272	28251	80395	166991	141592	54937	22719	22243	20063	....	....
1913........	20906	20049	21090	26301	66898	96813	60442	26501	23802	23058	21064	21828	428752
1914........	21800	19300	21800	20700	69500	165000	154000	81200	28400	27900	24600	....	....
1915........	23700	19300	22800	32600	47500	125000	81200	42900	26500	25100	22300	22100	491000
1916........	22400	20000	33600	31300	67000	138000	112000	83600	30200	29600	30300	28200	626200
1917........	28000	22800	24200	23300	50300	177500	147000	57200	28400	17100	19200	21000	615900
1918........	20200	23100	22200	20000	60900	200000	85500	48700	32700	25600	25600	....	....

*Estimated from fractional month's records.

Run-Off in Acre-Feet of Arkansas River at Pueblo.

Drainage Area, 4,600 Square Miles. Altitude, ... Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1886	....	....	....	....	*192000	*288000	106000	91100	....	....	....	....	....
1887	....	....	....	....	....	205000	206000	107000	....	....	....	....	....
1894	....	....	....	....	....	....	....	....	....	25800	24500	23000	....
1895	28300	26400	21900	44300	96000	128000	117000	78400	29400	33900	31500	28400	....
1896	31900	26200	24300	19800	67500	53200	38900	30100	18400	18000	18700	24600	....
1897	19900	18200	13000	14400	100000	132000	62500	28800	16200	25400	28800	21900	....
1898	20300	21400	19700	22000	51700	131000	98700	18800	7450	12900	18500	22400	....
1899	25100	33700	24900	24900	103000	201000	126000	43400	12300	15700	18500	14400	....
1900	25300	23200	24000	48900	184000	238000	54000	19300	13800	19700	25900	24300	....
1901	29100	23000	19800	32800	103000	140000	61800	47300	25500	19700	19700	27400	....
1902	21211	59500	15900	14000	53900	32400	17100	38300	16200	19200	18400	20600	....
1903	20100	16500	22400	23900	30000	153000	79700	44300	17500	14900	....	....	....
1904	....	....	....	21200	77500	102000	60000	53800	34400	49800	27200	26200	....
1905	14100	16200	29200	64100	128000	230000	51900	48600	20600	16800	22900	28800	....
1906	26800	18500	19000	27900	77800	133000	98100	57500	44000	61700	55900	....	....
1907	....	....	18600	20700	61300	157000	185000	71500	41100	34800	23500	24800	....
1908	....	....	*14800	23900	29500	77700	55200	24900	7030	13600	14800	....	....
1909	....	....	....	....	40800	160000	115000	74800	108000	46000	33800	44900	....
1910	53700	23500	33000	43200	108000	108000	45300	26100	14500	15900	16900	15300	....
1911	15900	15300	20400	12900	67800	132000	127000	60100	27600	63700	37200	24500	....
1912	19100	15900	17500	17900	71300	174000	138000	59500	23300	40900	47800	18200	....
1913	17000	18300	14000	23300	64600	86900	58500	21400	21700	22100	18700	23700	....
1914	21300	19500	23700	27800	86100	189000	184000	113000	30300	33000	24900	....	....
1915	30700	20400	25400	45000	56300	130000	83000	53900	25500	30400	23400	25100	....
1916	25000	18900	30900	27800	69500	126000	103000	74400	20900	27600	27900	....	....
1917	24200	19600	16700	17000	43000	166000	134000	57200	26900	19900	19200	15700	....
1918	17600	10600	12100	13000	48300	179000	65200	21200	20800	12400	14500	12400	....

Run-Off in Acre-Feet of Arkansas River at Holly.

Drainage Area, ... Square Miles. Altitude, 3,387 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1907	....	....	....	....	....	....	....	....	....	....	9340	15900	....
1908	....	....	*4630	1130	892	25600	8240	8610	....	442000	22100	18000	....
1909	18000	3890	2520	952	492	27200	28700	38500	93600	10900	9520	17300	....
1910	255000	84900	11300	9640	5100	2980	2640	56500	595	615	595	1410	....
1911	3290	3270	3930	1000	8290	2010	33500	2720	292	3390	20600	24900	....
1912	....	20800	25300	8220	1050	36700	6350	67300	14400	6140	11500	12800	....
1913	30700	24700	14000	1910	357	9400	19600	1080	833	885	1330	10600	....
1914	14000	8780	3980	2430	166000	189000	97200	54800	1530	3940	5030	....	....
1915	13500	11200	16100	69600	79300	146000	23500	98400	12900	6090	7140	12000	....
1916	18100	28100	5600	4160	572	7140	781	48200	9100	3850	8690	....	....
1917	16500	9550	5920	....	....	*2230	2370	4520	4400	2950	1390	4140	....
1918	6330	4550	4870	2010	1680	5740	7990	2560	6310	2900	5180	8730	....

*Estimated from fractional month's records.

Run-Off in Acre-Feet of Purgatoire Creek at Trinidad.

Drainage Area, 742 Square Miles. Altitude, 5990 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1897	....	....	....	9800	45029	23919	15497	15737	5800	3681	2499	....	....
1898	....	....	....	....	16342	22413	15929	11139	10266	2406	2489	....	....
1899	....	....	....	4873	6748	4201	27049	....	....	....	....	....	....
1905	....	....	....	....	....	....	....	....	2814	1095	2069	8174	....
1906	....	....	....	....	....	....	....	....	....	*3220	2563	1722	....
1907	1140	700	....	....	....	....	....	....	....	....	2297	2781	....
1908	....	....	*1170	2081	3519	2793	16187	21366	3368	1589	714	....	....
1909	....	....	....	....	....	....	....	....	17256	3074	2142	....	....
1910	553	555	2214	9580	17770	8212	4735	4120	1488	1168	1071	....	....
1911	571	343	1198	374	4262	8140	35722	6585	2331	9390	1956	436	....
1912	587	1083	3479	4403	12970	23304	17702	13636	3687	2981	2176	....	....
1916	....	....	....	1560	16000	16900	3660	7440	298	529	....	....	....
1917	....	....	....	595	8240	11700	10600	5110	3800	1550	1810	....	....
1918	....	....	....	3110	3610	10500	....	....	....	....	....	....	....

GRAND DRAINAGE

Run-Off in Acre-Feet of Grand River at Glenwood Springs.

Drainage Area, 4,520 Square Miles. Altitude, 5,747 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1900	54700	49000	73000	108000	736000	882000	192000	69800	47600	46400	48000	41800	....
1901	42300	41600	51600	112000	849000	724000	304000	117000	62300	56600	52400	48500	....
1902	44400	43100	49400	85200	602000	437000	*115000	....	....	....	....	....	....
1903	*28000	30200	45500	100000	355000	762000	321000	99200	80000	80800	51000	31800	....
1904	33100	34800	56000	136000	478000	628000	272000	140000	106000	81300	50800	36800	....
1905	46300	37300	55700	97600	411000	988000	222000	107000	80700	70200	63500	42100	....
1906	37500	38000	65100	166000	600000	827000	365000	170000	199000	106000	65600	49300	....
1907	41400	47400	95400	189000	419000	1100000	702000	202000	99200	86300	63600	51600	....
1908	58600	42900	69600	132000	233000	469000	202000	128000	52600	59100	52700	40400	....
1909	47400	36900	52900	94000	358000	1460000	521000	179000	148000	89800	66000	47500	....
1911	43100	41600	57900	107000	486000	694000	309000	119000	76100	88500	54400	40100	....
1912	47800	43400	49500	84100	473000	1180000	603000	200000	98900	88900	51400	....	....
1913	*46400	37400	43300	177000	432000	424000	198000	87900	82700	86700	63100	41900	....
1914	45100	41900	62100	155000	769000	1110000	358000	167000	101000	101000	58300	38000	....
1915	38600	37100	45700	136000	284000	567000	273000	85300	60700	68900	48000	42700	....
1916	44400	39500	76900	143000	454000	702000	299000	188000	105000	96500	62500	48300	....
1917	42700	40900	48100	173000	422000	1180000	584000	155000	90400	72600	69000	59300	....
1918	50800	49000	78700	126000	566000	1170000	328000	112000	100000	89200	67800	....	....

*Estimated from fractional month's records.

Run-Off in Acre-Feet of Grand River at Fruita.
Drainage Area, 16,800 Square Miles. Altitude, 4,500 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1908	....	....	....	484000	670000	1200000	513000	....	....	....	....	....	....
1909	....	....	....	389000	1430000	2710000	1170000	....	....	....	....	....	....
1910	....	....	....	643000	1320000	1150000	391000	....	....	....	....	....	....
1911	....	....	....	....	1380000	1730000	861000	274000	202000	429000	203000	....	....
1912	....	....	206000	337000	1750000	2550000	1330000	462000	238000	267000	216000	....	....
1913	....	....	....	619000	1180000	1060000	326000	164000	218000	239000	190000	....	....
1914	....	....	209000	505000	2060000	2460000	965000	414000	236000	321000	196000	....	....
1915	....	....	149000	415000	787000	1280000	548000	168000	118000	167000	160000	156000	....
1916	163000	164000	303000	552000	141000	1910000	769000	536000	240000	397000	231000	....	....
1917	166000	144000	173000	462000	1350000	2770000	1350000	360000	198000	177000	175000	....	....
1918	....	....	250000	382000	1340000	2230000	633000	192000	224000	205000	200000	....	....

Run-Off in Acre-Feet of Williams Fork near Parshall.
Drainage Area, 198 Square Miles. Altitude, 7,800 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1908	2700	2060	2520	5890	11700	30500	12400	6210	3330	3870	3390	4000	....
1909	2400	1890	2770	3810	14500	57300	32600	10100	9100	5840	3750	2770	....
1910	3630	2720	3570	7020	19100	29300	7130	4430	5360	4180	3390	3280	....
1911	2830	2770	3640	4830	17600	31100	16300	6070	4470	5170	3960	3690	....
1912	3480	3100	3300	3953	18000	57500	40600	14000	6460	5610	4200	....	....
1913	....	....	....	....	23400	32000	12900	5380	5590	5690	4000	....	....
1914	3280	2830	2910	5740	34600	65500	25200	8240	5190	5510	4430	....	....
1915	2560	2340	2590	6070	13500	45000	26900	6210	4030	4850	3900	2750	....
1916	2290	2410	3900	6250	18000	38800	17600	9960	6190	5630	3670	3250	....
1917	3210	2280	2770	6190	15700	61900	37600	9280	4740	4720	4600	3410	....
1918	3010	2580	3500	5470	27200	79100	23000	6950	5850	5600	....	....	....

Run-Off in Acre-Feet of Eagle River at Eagle, Colo.
Drainage Area, 630 Square Miles. Altitude, 6,588 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1906	....	....	....	29700	126000	163000	75500	31900	27800	23400	17800	13700	....
1911	3690	4150	6820	24000	108000	134000	20000	25000	15400	11400	14600	10100	377000
1912	6150	5180	6520	16400	100000	201000	144000	31500	10700	12300	10900	....	....
1913	....	....	....	*25100	116000	121000	59000	21000	18600	20300	13100	....	....
1914	....	....	....	25300	169000	233000	88500	35300	22000	18600	*11600	....	....
1915	....	....	7260	19900	75000	153000	67000	20000	10900	12100	9100	....	....
1916	....	....	*10900	26800	107000	178000	91000	43500	16400	15900	*11100	....	....
1917	....	....	....	22000	71300	249000	132000	28900	17100	10800	9940	....	....
1918	....	....	*12000	22400	130000	268000	68900	16500	15600	11300	*8200	....	....

*Indicates estimates from parts of month's records.

Run-Off in Acre-Feet of Roaring Fork River at Glenwood Springs, Colo.
Drainage Area, 1,450 Square Miles. Altitude, 5,747 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1906	....	....	....	64900	264000	420000	246000	97700	68200	58000	35900	25900	....
1907	22600	20400	34100	88700	148000	373000	337000	121000	61000	49300	30000	27900	1314000
1908	26600	23000	30700	69000	115000	261000	133000	74600	31800	32600	26600	28000	853000
1909	25200	20100	25900	46500	179000	497000	250000	90800	90900	....	....	....	....
1911	24800	21600	31600	61800	235000	....	....	....	*60200	91700	38900	32100	....
1912	27400	22100	26000	53600	248000	597000	308000	133000	58500	49900	41000	33300	1590000
1913	....	....	26200	66600	239000	276000	72800	47500	47700	43200	36500	29000	....
1914	....	....	....	....	410000	655000	383000	80600	47100	44500	30000	....	....
1915	....	20500	22800	38900	85500	256000	127000	41800	31300	30700	27900	26100	....
1916	24800	21200	37400	69000	189000	402000	229000	115000	58800	67000	39000	36600	....
1917	32000	26000	32200	58300	170000	499000	341000	103000	64900	46900	37200	30900	....
1918	29500	24500	36800	58200	227000	578000	167000	61100	63100	51500	41500	....	....

Run-Off in Acre-Feet of Gunnison River at Gunnison.
Drainage Area, 1,014 Square Miles. Altitude, 7,673 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1911	16100	16500	26600	31000	....	....	....	....	26400	48900	17200	17500	....
1912	15700	13500	16800	25200	169000	256000	112000	41800	25700	20900	13300	....	....
1913	....	....	....	....	130000	134000	57300	27000	23700	24000	19000	....	....
1914	....	....	....	30000	221000	267000	129000	65200	30300	36000	29200	....	....
1915	....	....	....	....	....	....	....	....	....	....	....	....	....
1916	....	....	....	....	164000	227000	119000	60000	31800	....	....	....	....
1917	....	....	....	....	93500	249000	165000	55400	24500	20800	18300	12300	....
1918	11700	14200	18400	30800	167000	361000	96500	34000	36500	....	....	....	....

*Indicates estimates from parts of month's records.

NORTH AND SOUTH PLATTE DRAINAGES

Run-Off in Acre-Feet of South Platte River at South Platte.
Drainage Area, 2,610 Square Miles. Altitude, 6,097 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1902	....	....	....	15500	11100	7610	5250	4980	4860	3790	....	....	....
1903	....	....	....	8570	13090	51100	21700	12400	12600	6950	9700	5960	....
1904	9530	7420	3690	11700	28900	32200	25900	38900	21800	18500	2920	....	....
1905	....	....	....	*31900	81200	73000	21200	17500	15100	10300	*9940	....	....
1906	....	....	....	27800	54500	43000	31600	21500	28400	30300	22500	....	....
1907	....	*6160	13400	17800	39200	71400	73500	43500	21100	14100	*9200	....	....
1908	....	....	*7440	10300	11700	15200	17000	24000	14000	10800	*4180	....	....
1909	3320	2780	5230	9280	26100	61400	56900	54500	101400	37300	18800	12700	....
1910	12800	9560	26900	24700	37000	27600	19200	24900	10200	10200	7800	4750	....
1911	6360	5300	5140	11200	22200	29200	53100	22900	14400	8830	5620	6700	....
1912	5810	4200	4600	6160	28900	77800	77100	45500	22900	15300	13200	....	....
1913	6640	4610	5530	23600	35200	56100	46800	33400	25300	19900	12600	10500	....
1914	11000	7940	13000	56500	136000	126000	114000	104000	38200	31600	18500	....	....
1915	10600	7110	6890	32100	59400	70200	43500	28200	25300	24300	12300	9590	....
1916	7260	7130	9040	13100	31100	43700	38100	41100	13700	9350	7860	8480	....
1917	8850	6330	6210	11200	42800	86300	65800	45400	20100	....	....	....	....
1918	....	....	6040	23100	48700	79700	56400	27200	21200	14100	11500	....	....

Run-Off in Acre-Feet of South Platte River at Kersey. (Head of District No. 1.)
Drainage Area, 9,470 Square Miles. Altitude, 4,612 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1901	....	....	....	....	85654	108300	19307	18200	23504	28038	31299	55523	....
1902	51404	47873	29883	7260	5903	9402	7624	5226	21600	15310	19398	32711	....
1903	32220	32156	56446	30823	13712	76046	11806	8424	7914	13097	23623	27239	....
1904	....	....	....	....	....	....	....	....	....	....	....	....	....
1905	....	....	13958	139716	387433	243018	9469	10514	9521	23550	31716	2844	....
1906	30867	25880	35970	47663	74031	21362	21951	8670	28324	60688	85809	....	....
1907	....	....	34883	*32250	110019	133529	108308	47103	22376	46673	45669	43494	....
1908	....	....	20801	7074	9949	7646	7698	10856	7638	24516	25809	....	....
1909	....	....	....	....	55300	300000	142000	21300	129000	73800	58100	....	....
1910	*61900	47740	60485	22965	14243	5802	5897	5887	6242	23151	25123	20602	....
1911	28048	20618	18496	7281	5147	8844	11996	7557	6095	17867	25684	22348	179982
1912	21961	19540	26450	19922	38041	89700	153993	60604	31104	38112	47737	....	....
1913	....	....	....	....	....	....	....	....	....	....	....	....	....
1914	83000	103000	88500	181000	492000	326000	48900	106000	33400	51400	50700	....	....
1915	38000	39100	41800	118000	213000	161000	25100	27400	23500	76200	57900	48500	....
1916	*37100	*44900	39800	30800	27700	13900	7500	19700	*10700	*58100	47100	45300	....
1917	38100	33300	39200	32100	242000	371000	80600	11100	15800	39000	37000	40300	....
1918	35100	34400	29800	31700	18300	138000	104000	16900	37400	48900	47500	53200	....

*Estimated from fractional month's records.

Run-Off in Acre-Feet of South Platte River at Julesburg. (Colorado-Nebraska Line.)
Drainage Area, 20,600 Square Miles. Altitude, 3,469 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1902	....	....	....	2737	2275	1666	1168	184	9104	7870	2200	52800	....
1903	....	....	....	26500	2310	857	168	7930	899	990	*1780	....	....
1904	....	....	3505	1020	5903	99078	11191	3013	1408	4735	6486	*18800	....
1905	....	....	35724	113237	363000	285858	12200	42700	2440	4366	18625	34700	....
1906	....	....	....	37800	18600	2530	2390	1300	1810	41800	....	....	....
1907	....	....	....	....	....	....	....	....	....	....	....	....	....
1908	....	....	....	....	*7270	3450	3810	3260	2320	....	9160	....	....
1909	....	....	....	63670	25920	168350	*89100	....	98600	71870	79760	....	....
1910	....	....	*50604	18327	2521	286	498	1586	1392	1968	1434	11282	....
1911	37220	25718	9130	1539	1480	996	668	3356	694	1254	1585	1121	....
1912	6859	16066	21227	16765	*6850	1511	3493	34769	26018	22505	20374	....	....
1913	....	....	....	....	....	....	....	....	....	....	....	....	....
1914	....	....	....	*98300	363000	265000	11700	14400	26500	20700	46600	....	....
1915	....	....	....	73800	189000	141000	7070	15200	8810	48000	58400	60200	....
1916	....	....	24800	3630	4580	2980	1610	1780	2140	6820	11800	....	....
1917	18300	36700	31700	25700	109000	281000	32000	2080	4490	33300	23400	29900	....
1918	....	....	....	8510	6890	7740	21700	17600	12500	29600	26400	31100	....

Run-Off in Acre-Feet of Clear Creek at Golden.
Drainage Area, 380 Square Miles. Altitude, 5,620 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1909	3689	2741	3443	5988	20481	74813	68856	26162	27443	12946	7226	6660	260450
1910	....	....	....	....	....	....	....	....	....	....	....	....	....
1911	....	....	....	....	....	*43800	31000	10800	6190	....	....	....	....
1912	1968	1553	2459	2670	21071	76742	71426	25151	9856	7692	4945	....	....
1913	3345	2460	3154	6307	26132	38380	28100	16048	13329	11252	8093	4612	161203
1914	....	....	....	13000	68900	102000	47800	26500	10100	7440	4210	....	....
1915	....	....	....	6430	24900	64300	39600	15200	8090	7130	*4800	....	....
1916	....	....	*3700	5680	19100	38700	27000	20300	10800	7620	....	....	....
1917	2980	2980	3210	5050	18700	61300	47300	16300	5860	....	....	....	....
1918	....	....	....	*6900	26700	79700	42200	*11200	*8400	6950	*5350	....	....

*Estimated from fractional month's records.

Run-Off in Acre-Feet of South Boulder Creek at Marshall.
Drainage Area, 125 Square Miles. Altitude, 5,800 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1888	......	......	......	*4000	8301	11365	8116	5841	3154	*3000	......	......	......
1889	......	......	......	......	......	20350	9346	2398	1250	1229	270	......	......
1890	......	......	......	......	*17000	20767	9223	3935	2142	*1840	......	......	......
1891	......	......	......	4879	22935	21183	8608	2767	1190	......	......	......	......
1892	......	......	......	......	*11000	22255	14265	3812	1250	1107	......	......	......
1893	......	......	......	......	......	......	......	......	......	......	......	......	......
1894	......	......	......	......	......	......	......	......	......	......	......	......	......
1895	......	......	......	......	......	......	......	......	......	......	......	......	......
1896	......	......	......	4284	13466	12139	4612	2644	2202	1414	......	......	......
1897	......	......	......	......	17673	23861	14388	7932	2559	2398	2083	......	......
1898	......	......	......	......	11929	16959	8424	2582	1309	1229	1071	......	......
1899	......	......	......	6843	17094	24754	14941	5595	2083	......	......	......	......
1900	......	......	......	......	......	21183	5718	1783	536	......	......	......	......
1901	......	......	......	2797	*8150	13626	7256	2951	1123	......	......	......	......
1902	......	......	......	......	......	......	......	......	......	......	......	......	......
1903	......	......	......	......	......	......	......	......	......	......	......	......	......
1904	......	......	......	......	......	......	*9000	4120	2321	1537	1071	922	......
1905	246	167	922	8509	19860	21838	6518	2029	893	553	298	307	......
1906	......	......	......	5593	17893	18684	9777	2890	2975	3443	2202	1353	......
1907	......	......	......	4403	17647	25765	15925	3812	1547	1537	893	861	......
1908	861	690	1045	2261	4858	10115	4980	3382	1190	1107	952	861	......

(Station moved to Eldorado Springs, 3 miles upstream.)

South Boulder Creek at Eldorado Springs.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1909	738	611	1107	6307	15864	33977	15556	6026	6010	2214	1250	799	......
1910	553	444	1291	2083	6395	7021	3074	1476	714	676	536	437	......
1911	202	173	980	1728	8561	13950	7359	2279	990	1016	766	530	......
1912	210	339	498	2376	12528	20182	13073	3884	1660	1388	1020	......	......
1913	......	......	......	3463	10453	10711	4439	1605	1952	2244	1386	......	......
1914	......	......	1760	10500	36200	24300	9960	5100	1820	1990	1170	......	......
1915	......	......	......	7620	17700	25900	11100	3790	2230	2080	1620	1480	......
1916	1070	995	1400	2890	9350	13300	5630	3670	1420	2240	1360	......	......
1917	......	......	1280	3630	12700	21100	9220	3010	1060	849	976	......	......
1918	......	......	1740	3800	15500	25300	9720	2830	2260	2470	1740	892	......

*Estimated from fractional month's records.

Run-Off in Acre-Feet of Boulder Creek at Orodell.

Drainage Area, 108 Square Miles. Altitude, 5,723 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1888........	....	....	....	4810	9960	15500	12900	9710	4760	*3450	....	....	....
1907........	....	....	*1770	4180	14400	27800	28800	10100	3710	*1950	....	....	....
1908........	....	*270	615	2780	6830	15100	9840	7320	3270	1230	1190	615	....
1909........	553	555	695	4160	10600	28700	22900	11200	6780	2150	1010	541	....
1910........	449	361	1107	2500	6580	10900	6520	3690	1640	922	494	450	....
1911........	236	373	270	1180	9240	18900	10500	3880	*1600	*900	1050	....	....
1912........	....	*1300	*525	*1240	*9900	*19500	*26000	*6600	*6100	*2790	1920	....	....
1913........	....	1880	1640	3370	5130	14500	8790	4270	4050	3090	2280	3300	....
1914........	3030	2350	1730	5560	*16700	....	16500	8240	4300	2780	2980	....	....
1915........	....	....	....	....	....	....	....	....	....	....	....	....	....
1916........	....	....	5080	4470	....	*19600	14700	8920	2870	1970	2490	....	....
1917........	....	....	....	....	*7570	16800	18800	5920	2180	1720	1890	2740	....
1918........	2950	2500	2480	2920	9290	28400	19300	6760	3320	3530	3340	....	....

Run-Off in Acre-Feet of St. Vrain River at Lyons.

Drainage Area, 209 Square Miles. Altitude, 5,349 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1887........	....	....	....	....	....	....	....	*9200	6520	*2550	....	....	....
1888........	....	....	....	3840	9720	19000	13000	8300	3390	*2460	....	....	....
1889........	....	....	....	....	....	21700	12100	6270	2560	2210	....	....	....
1890........	....	....	....	....	....	25900	18000	11000	3930	2830	*1350	....	....
1891........	....	....	....	9880	38700	62300	31700	9280	5650	....	....	....	....
1896........	....	....	....	4400	14100	19000	13000	9470	7680	3380	....	....	....
1897........	....	....	....	....	30300	39700	28100	16800	7320	2890	2080	....	....
1898........	....	....	....	....	13000	25600	14100	6270	3570	922	774	....	....
1899........	....	....	....	12800	16000	44000	40000	18400	5060	2580	1250	....	....
1900........	....	....	....	*14000	39000	37100	16600	5960	3930	2890	*1300	....	....
1902........	....	....	....	1780	12000	16700	6270	3200	4050	3680	....	....	....
1903........	....	....	....	9720	14100	40300	22600	7870	3810	2460	....	....	....
1904........	....	....	....	....	....	....	20400	10800	5890	3200	1430	....	....
1905........	....	....	....	....	26900	50600	17000	8980	3510	....	....	....	....
1906........	....	....	....	*14700	24500	27600	21300	11100	6490	....	....	....	....
1907........	....	....	....	....	*26000	42000	43100	16700	4720	3150	*1080	992	....
1908........	....	....	....	2300	6140	15700	13700	11300	5690	2400	2200	....	....
1909........	....	....	....	....	18300	43200	31600	11700	7620	2880	1610	1200	....
1910........	1040	722	1480	2380	9220	14300	8980	4670	4050	1600	893	839	....
1911........	700	445	1130	2480	*12600	25300	15400	6290	3650	3020	1130	472	....
1912........	456	345	797	3810	21700	37400	32900	10800	5050	4070	1680	....	....
1913........	....	....	....	*5750	15100	18600	11700	5410	5890	5230	1960	....	....
1914........	....	....	3520	14200	33000	45700	21900	11800	4750	3410	1750	....	....
1915........	....	....	*860	14800	19400	30800	20000	9780	7440	5790	2490	*880	....
1916........	....	....	*2040	4200	16800	25400	19100	10800	5100	4420	2700	1070	....
1917........	579	578	1060	5560	29000	41800	29600	9160	3950	1240	1000	892	....
1918........	732	605	1060	2550	9960	46600	21600	9040	5170	4650	1430	1030	....

*Estimated from fractional month's records.

Run-Off in Acre-Feet of Cache la Poudre River at Mouth of Canyon.

Drainage Area, 1,060 Square Miles. Altitude, 5,070 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1881	......	......	......	......	......	......	53915	......	......	......	......	......	......
1882	......	......	......	......	......	......	......	......	......	......	......	......	......
1883	......	......	......	......	......	......	......	......	......	......	......	......	......
1884	......	......	*3670	13010	155958	286356	131817	48674	18151	*11000	......	......	......
1885	......	......	......	*20000	87233	173200	114162	40370	16210	*10000	......	......	......
1886	......	......	......	......	80487	111627	44087	20783	11008	*7140	......	......	......
1887	......	......	......	......	......	......	44980	18760	......	......	......	......	......
1888	......	......	*5670	10590	29390	*63700	24640	13400	6250	......	......	......	......
1889	9516	6127	3306	6718	47370	79660	31420	11535	4082	4282	5200	3954	213170
1890	5042	4404	5230	11900	64200	76200	39844	17831	6129	4919	3630	4000	243330
1891	5655	4225	3606	8545	72839	113048	33298	14005	8216	7285	4959	4834	280515
1892	3940	6670	4800	*6700	*24600	90000	45190	......	......	......	......	......	......
1893	......	......	......	......	*34500	*107000	*37700	*15000	......	......	......	......	......
1894	......	......	......	......	85470	122760	51390	20820	9780	6450	*5700	......	......
1895	......	......	......	......	*95000	*135000	67170	30450	*12800	......	......	......	......
1896	......	......	......	......	......	......	28140	16700	*15900	......	......	......	......
1897	......	......	......	......	126000	100010	46070	21700	......	......	......	......	......
1898	......	......	......	......	39800	75200	29380	*9480	4790	*3740	......	......	......
1899	......	......	......	......	*72000	156610	88590	34250	12640	*6830	......	......	......
1900	......	......	......	......	172700	175080	44330	16290	8870	*7200	......	......	......
1901	......	......	......	......	108030	116410	*48700	20720	9040	*6730	......	......	......
1902	......	......	......	......	......	......	25271	10514	9878	*8520	......	......	......
1903	......	......	......	......	47420	161450	......	......	......	......	......	......	......
1904	......	......	......	9406	......	......	64150	20140	10460	*7450	......	......	......
1905	......	......	......	18863	63400	161057	55830	20906	9418	*6570	......	......	......
1906	......	......	......	*14900	66574	98290	57500	*17300	*11700	*8240	......	......	......
1907	......	......	......	7081	39712	165328	109096	29112	11181	*8290	......	......	......
1908	......	......	......	8039	*33400	88839	43956	47098	13613	*8580	......	......	......
1909	......	......	......	14200	43230	220300	113800	28320	19720	8554	......	......	......
1910	......	......	......	......	*44900	56469	16540	7870	9045	9192	5891	3212	148696
1911	2975	2410	2462	4118	50363	101578	46973	13426	10316	7716	3876	2797	249010
1912	2668	3015	4173	3727	48241	130074	75646	26394	12585	10035	2795	......	......
1913	......	......	......	*5950	56568	73370	32465	16294	12139	11314	*5950	......	......
1914	......	......	......	12800	132000	149000	50300	20600	11600	5620	3960	......	......
1915	......	......	......	*16900	36300	90400	43000	16800	12400	7130	8810	*4670	......
1916	......	......	*3470	8980	52100	101000	46400	24400	15600	7010	*3030	......	......
1917	......	......	......	7970	79300	238000	126000	24100	17400	6820	4440	4430	......
1918	......	......	......	7680	48100	151000	59000	16900	10410	5410	4140	......	......

*Estimated from fractional month's records.

Run-Off in Acre-Feet of Big Thompson River at Arkins.

Drainage Area, 305 Square Miles. Altitude, ... Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1888	....	....	....	*3200	7070	25400	15100	9960	3690	*2170	....	....	....
1889	....	....	....	....	*13300	22700	12500	5470	2920	2830	....	....	....
1890	....	....	....	....	*25500	31500	27200	24200	8980	*4370	....	....	....
1891	....	....	....	....	....	*48400	23600	9780	5650	....	....	....	....
1892	....	....	....	....	*16000	41900	30600	9280	3090	....	....	....	....
1895	....	....	....	....	*17500	33900	28600	19600	8690	4860	....	....	....
1896	....	....	....	....	13400	17000	13800	8850	7080	4060	....	....	....
1897	....	....	....	....	25800	27500	16400	8180	3970	1030	1600	....	....
1898	....	....	....	....	10100	22400	14700	4860	2130	742	496	....	....
1899	....	....	....	8330	18600	54600	40200	17300	5470	3540	....	....	....
1900	....	....	....	24500	85000	81000	21500	8420	4580	....	....	....	....
1902	....	....	....	1730	17800	27700	9900	4920	4400	5160	....	....	....
1903	....	....	....	*3920	14800	44300	31700	8920	*4180	....	....	....	....
1904	....	....	....	....	....	....	....	13900	7140	4610	3270	2950	....
1905	1800	....	....	10100	28300	61700	29000	*11200	....	2660	2500	2590	....
1906	....	....	*1930	10400	26300	42500	37700	12700	5660	7810	8810	5410	....
1907	....	....	....	*5800	24300	57100	61200	20300	....	....	....	....	....
1908	....	....	....	*3710	8180	22700	22100	19000	7440	3200	3570	....	....
1909	....	....	....	*6260	22800	70600	48300	16300	11800	3380	2260	1720	....
1910	1780	1440	2400	3150	14600	23100	13400	5720	6840	2700	1610	1590	....
1911	....	....	....	....	*16900	32400	20000	6840	....	....	....	....	....

Run-Off in Acre-Feet of Laramie River Near Jelm, Wyo.

Drainage Area, 365 Square Miles. Altitude, ... Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1904	....	....	....	....	....	....	12746	4667	2547	2577	....	....	....
1905	....	....	....	2985	28175	69045	13057	6016	2356	1702	....	....	....
1906	....	....	....	....	....	....	....	....	....	....	....	....	....
1907	....	....	....	....	....	....	....	....	....	....	....	....	....
1908	....	....	....	....	....	....	....	....	....	....	....	....	....
1909	....	....	....	....	....	....	....	....	....	....	....	....	....
1910	....	....	....	....	....	....	....	....	....	....	....	....	....
1911	....	....	....	....	*34700	47125	13684	4389	2563	4185	3709	....	....
1912	....	....	....	*4900	30034	74097	33388	7367	4863	5121	3290	....	....
1913	....	....	....	....	31728	26241	8301	3382	3094	4366	3332	....	....
1914	....	....	....	*6680	58800	79700	14400	6640	2220	4400	....	....	....
1915	....	....	....	....	18700	28400	7930	4490	3770	4230	*4500	....	....
1916	....	....	....	6900	32500	45300	9470	6000	4900	5200	....	....	....
1917	....	....	....	....	28900	119000	53900	10600	4820	2740	*3360	....	....
1918	....	....	....	5530	35700	69600	14900	5580	3630	....	....	....	....

*Estimated from fractional month's records.

RIO GRANDE DRAINAGE

Run-Off in Acre-Feet of Rio Grande River at Wason.
Drainage Area, 700 Square Miles. Altitude, 8,590 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1907	....	....	....	....	102000	224000	215000	63000	37400	20400	14100	*14100	....
1908	....	....	11000	28700	73200	137000	55600	48900	18600	13900	9700	....	....
1909	....	....	....	31900	133000	224000	72300	41100	78800	27300	17200	12100	....
1910	11100	9000	29800	53600	142000	107000	26900	20000	14200	14000	11800	10500	....
1911	9250	8060	9520	29000	110000	182000	114000	47600	28200	80100	24600	14200	....
1912	11100	9350	10100	20200	151000	195000	84500	42100	18500	17800	9080	....	....
1913	....	....	....	19500	76900	72500	59300	34700	19800	....	....	....	....
1914	....	....	....	18000	105000	182000	96000	51900	37200	40000	14100	6270	....
1915	5700	5660	* 6950	16900	60800	143000	91600	53700	32700	26600	11500	6520	....
1916	9220	9320	17500	28100	98400	110000	86700	69500	23100	74400	35500	....	....
1917	....	....	*11500	17000	62700	237000	122000	52400	25900	18900	11200	5710	....

Run-Off in Acre-Feet of Rio Grande at Del Norte.
Drainage Area, 1,400 Square Miles. Altitude, 7,868 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1890	....	*28900	31100	54300	267000	219000	93100	37700	22700	28900	....	....	....
1891	....	....	....	83900	202000	245000	104000	40800	31500	57300	22300	....	....
1892	....	*19400	....	62300	158000	130000	45400	27100	15600	15900	*16400	....	....
1893	....	....	....	31700	120000	104000	24300	19900	16300	15400	*14200	....	....
1894	61800	55300	51700	39000	105000	47700	18000	19000	17000	17800	14000	....	....
1895	....	....	....	112000	130000	132000	58900	44300	27000	26900	21000	....	....
1896	....	....	....	88300	146000	48900	4800	16000	28400	28800	20100	....	....
1897	....	....	....	63300	218000	202000	68000	29300	37700	90600	39600	....	....
1898	....	....	....	114000	167000	261000	99400	31300	19000	16000	*16600	....	....
1899	....	....	....	36700	85100	64900	43200	36800	21700	30300	24900	24100	....
1900	....	....	21300	24900	175000	160000	33600	14200	15200	21100	15100	....	....
1901	....	....	....	39900	158000	106000	36600	28700	26700	16200	15200	....	....
1902	....	....	....	38000	71900	36800	9350	11000	12300	15000	12900	....	....
1903	....	....	....	44500	174000	309000	102000	32300	30700	21500	....	....	....
1904	....	....	....	38800	71200	42600	20700	42400	41200	83700	....	....	....
1905	....	....	....	45200	210000	325000	67100	35600	22300	26400	17600	17800	....
1906	....	....	21100	56000	238000	296000	116000	47300	42000	55200	32000	....	....
1907	....	....	....	....	....	364000	303000	90800	47800	....	....	....	....
1908	....	....	....	....	121000	192000	65600	57300	20600	16700	12200	....	....
1909	....	....	....	....	196000	284000	93600	53300	98700	40300	24900	23300	....
1910	20500	15900	38900	86600	210000	144000	37800	30500	18900	20700	18800	13600	....
1911	15300	13300	20700	57000	204000	287000	172000	59500	39800	151000	32300	25000	....
1912	20900	15700	17100	34400	229000	260000	108000	49900	26600	23700	15600	....	....
1913	....	....	....	*57900	144000	126000	65700	42200	29200	34600	22800	18600	....
1914	....	....	*17600	18700	172000	230000	129000	66700	48600	54200	16500	10600	....
1915	11100	12400	15900	37200	106000	206000	116000	62100	39300	33000	17400	12500	....
1916	17000	16600	34100	56500	181000	196000	124000	99000	38100	100000	47800	....	....
1917	....	....	*23900	37900	114000	359000	184000	65200	33800	25200	17600	10800	....
1918	11700	10800	16400	28700	116000	143000	64000	48600	34200	22400	15600	....	....

*Estimated from fractional month's records.

Run-Off in Acre-Feet of Rio Grande at Lobatos.

Drainage Area, 7,700 Square Miles. Altitude, 7,440 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1899........	....	....	....	....	....	....	2570	3253	6069	7194	15412	19676	....
1900........	....	....	....	20826	87928	84734	1814	1340	1821	2300	9223	....	....
1901........	....	....	24780	16661	103299	61051	5097	3775	3058	3394	4350	....	....
1902........	....	....	....	18922	30129	6843	1353	1021	1613	2072	1898	2305	....
1903........	1537	1388	2084	18684	123713	379339	72432	2878	5882	3929	....	....	....
1904........	....	....	7563	9104	1322	1208	1051	8608	11663	97765	....	....	....
1905........	....	....	55216	45997	349864	429382	16725	10022	3832	6272	13626	....	....
1906........	....	....	....	45283	205061	260033	90387	30990	25111	56753	*53400	....	....
1907........	....	....	....	116747	201187	410340	334493	107050	73071	35417	28145	....	....
1908........	....	....	41689	37428	47038	68192	19430	38307	18208	17770	*12100	....	....
1909........	15187	19438	32281	69020	219269	268960	37323	28653	140590	53371	34036	25025	....
1910........	27239	20438	76860	120969	207213	60278	1968	4550	2559	7010	13329	17740	....
1911........	22758	21086	23070	27441	128509	243134	221623	35581	41621	193230	....	....	....
1912........	30575	27977	36738	50004	261901	305905	49490	17320	11693	17393	21636	....	....
1913........	....	....	....	57064	50481	52661	4919	2336	4106	23611	23980	....	....
1914........	....	....	31600	38500	102000	156000	48400	43700	48600	45200	25500	16900	....
1915........	18000	16000	24500	49000	102000	125000	39700	26100	16700	15600	19500	18900	....
1916........	22600	26200	47800	51500	164000	114000	37700	83600	25500	94100	65500	....	....
1917........	....	....	*30900	55800	116000	296000	157000	17600	9520	12100	22400	22000	....
1918........	17300	20500	33000	15400	28100	52200	21100	3150	22500	10500	19700	....	....

*Estimated from fractional month's records.

Run-Off in Acre-Feet of Saguache River at Saguache.

Drainage Area, 595 Square Miles. Altitude, 7,800 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1910........	....	....	....	....	....	....	....	*3170	2602	2574	....	....	....
1911........	....	....	3661	4122	8820	12865	13809	7987	3775	6631	2848	....	....
1912........	....	....	....	4482	16572	14041	8172	7246	*4560	....	....	....	....
1914........	....	....	....	....	....	16500	10900	6760	3590	3140	1860	1020	....
1915........	1350	1450	2630	7080	13600	14000	5700	3650	3040	2530	2160	1970	....
1916........	1640	2090	3090	3430	11300	11500	6580	9900	4180	4050	2790	....	....
1917........	....	....	2180	4610	11500	20500	11100	4490	2790	2590	2150	1580	....
1918........	1600	1690	2450	2800	8420	9160	5980	4470	4670	2910	2730	....	....

*Estimated from fractional month's records.

Run-Off in Acre-Feet of Conejos River at Mogote.

Drainage Area, 282 Square Miles. Altitude, 8,300 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1900........	....	....	22160	....	....	....	....	....	....	....	....	....	....
1903........	....	....	....	*16900	79380	138169	39660	10637	9342	8485	....	....	....
1904........	....	....	....	16780	31297	19041	4685	19430	13864	31666	....	....	....
1905........	....	....	....	17435	94936	132456	32465	13097	5201	4396	....	....	....
1907........	....	....	*16100	28919	52080	108595	93338	26255	12853	6518	4921	6887	....
1908........	....	....	*8000	13031	34679	69799	26563	17708	7021	6333	5224	....	....
1909........	....	....	....	....	77694	118992	33905	19299	27749	9211	3957	4185	....
1910........	2945	2578	10427	29871	74896	41831	10945	10391	3808	3874	3511	3689	198766
1911........	3372	2491	4969	21580	85240	123154	70113	20523	17159	....	....	....	....
1912........	4681	3144	5603	13204	113798	102732	38611	9511	3754	5020	5113	....	....
1913........	2644	2444	3443	8926	55954	48734	12113	4120	3868	7379	3154	....	....
1914........	....	....	*7700	17700	58600	80600	28100	18900	17000	13100	4380	2230	....
1915........	2310	2820	3730	18400	45400	92800	43000	12900	5950	5000	3570	2470	238000
1916........	2360	2970	5230	21700	90400	129000	50200	24000	10800	20400	7500	....	....
1917........	....	....	....	19400	46400	138000	76200	15400	5360	3080	2630	1910	....
1918........	1400	1850	4870	12900	58400	89300	30100	9900	7140	4070	3380	....	....

*Estimated from fractional month's records.

SAN JUAN DRAINAGE

Run-Off in Acre-Feet of San Juan River at Arboles.

Drainage Area, 1,394 Square Miles. Altitude, ... Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1895	....	....	....	....	....	*75000	39700	25900	13100	12700	11700	....	....
1896	....	....	....	*66800	101000	26200	15700	11600	18400	15400	12500	....	....
1897	....	....	....	115000	209000	137000	42100	18600	36100	62600	23600	....	....
1898	....	....	....	91500	116000	142000	62800	16200	7320	6110	4940	....	....
1899	....	....	....	....	56400	32700	32200	23700	12900	....	....	....	....
1910	....	....	....	....	....	....	....	*13300	7190	11500	9030	7080	....
1911	7450	8400	88000	118000	194000	218000	174000	53100	46100	....	....	....	....
1912	14300	11200	53500	91900	198000	166000	63800	21500	11000	15400	12000	....	....
1913	6150	6390	13800	98200	117000	92800	24700	10500	12100	19000	12100	9040	....
1914	8610	10600	44600	83900	165000	168000	61500	35700	39200	52400	16500	....	....
1915	10000	9870	27900	117000	166000	196000	106000	26300	32600	12900	8740	8130	....
1916	10900	29600	126000	118000	148000	174000	85800	91900	31900	80200	23100	15400	....
1917	18600	18000	45400	110000	135000	247000	133000	26000	13500	8220	5920	4240	....
1918	4220	5420	41600	45400	95400	123000	58500	21300	20400	8190	8790	4240	....

Run-Off in Acre-Feet of Animas River at Durango.

Drainage Area, 694 Square Miles. Altitude, 6,550 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1910	22100	15700	57600	77100	149000	117000	37800	25400	16400	14800	11300	6760	....
1911	14400	9140	28600	102000	190000	237000	201000	55100	34300	*205000	37400	18900	....
1912	17100	14200	17800	37500	223000	212000	108000	43400	22000	18700	16700	....	....
1913	9220	9000	11900	46800	135000	123000	49600	23900	33400	29600	17300	13800	....
1914	12900	10300	29900	59500	195000	270000	132000	40300	22400	40100	20100	....	....
1915	12300	9400	17800	71400	138000	204000	105000	33700	22200	20200	16000	13100	....
1916	12400	13600	51900	83400	181000	255000	114000	85800	27900	103000	32600	20000	....
1917	19500	16300	20000	55200	122000	348000	179000	46900	25700	22900	13400	8770	....
1918	12100	7200	18400	32500	116000	167000	55000	36200	45600	21700	16500	16600	....

Run-Off in Acre-Feet of Animas River Near Durango.

Drainage Area, 812 Square Miles. Altitude, ... Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1895	....	....	....	....	....	....	23900	31400	21600	19100	14600	....	....
1896	....	....	....	....	143000	52100	21500	12200	59700	29200	16300	....	....
1897	12200	10200	15700	161000	280000	200000	70800	34000	53900	87200	34100	23800	....
1898	24100	14400	19000	89900	109000	204000	83900	22400	15600	10000	9400	....	....
1899	....	....	....	34800	106000	107000	41100	42500	16400	17900	15600	13400	....
1900	11000	7320	12200	19900	134000	118000	25100	11000	13700	15800	12200	13200	....
1901	....	....	....	50300	....	....	....	....	....	....	....	....	....
1902	....	....	....	26500	104000	70200	16700	16800	17800	15700	....	....	....
1903	....	....	....	92500	199000	246000	150000	34100	32300	21400	....	....	....
1904	....	....	....	....	....	....	*28500	55500	43900	103000	30400	....	....
1905	....	....	....	87200	239000	375000	112000	50200	31800	32100	17200	*14500	....

1906-1909, no records. New station established in 1910 above mouth of Lightner Creek.

*Estimated from fractional month's records.

YAMPA AND WHITE RIVER DRAINAGES

Run-Off in Acre-Feet of Yampa River at Steamboat.

Drainage Area, 525 Square Miles. Altitude, ... Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1904					*121000	93700	17100	10200	9100	10200			
1905				24900	86400	145000	15600	5660	4340	5410			
1906				48600	137000	149000	24500	10200	10200	9780			
1910			26600	44800	110000	59300	8240	8240	6840	6760	7970	4840	
1911	5580	5620	12500	28700	89100	101000	18300	6510	5280	11700	8250		
1912		8970	9460	33200	113000	175000	67900	20700	13100	16000	11400		
1913				*47900	113000	53000	9780	5100	4880	5350	4520	*4350	
1914			*11900	46600	149000	140000	18900	11400	9360	13400	8660		
1915					78700	76800	10100	4260	4810	6490	4810	3480	
1916			*21100	52300	91600	120000	19000	15700	9100	13100	8100		
1917				*31500	109000	224000	67600	12800	9400	6890	7380	6640	
1918	7380	6940	15400	35900	104000	149000	34600	9220	9460	14100	*12000		

Run-Off in Acre-Feet of Elk River Near Clark.

Drainage Area, 213 Square Miles. Altitude, ... Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1910					65200	54400	9650	4800	2140	3500	3390	3380	
1911						91400	25300	10400	6760				
1912				12100	124000	139000	49800	19300	8700	6280	5810		
1913				21300	69700	42100	14400	7060	5780	7200	*5340		
1914				19600	85400	91900	24700	7750	6300	7700	5230		
1915				*37300	44500	67300	13500	10000	8900	5830	5570		
1916				20200	62100	88100	40700	18100	8630				
1917				20300	65800	144000	96500	18300	7730	4350	4060		
1918					93400	121000	36300	10300	4560				

Run-Off in Acre-Feet of Elk River at Trull, Colo.

Drainage Area, 415 Square Miles. Altitude, 6,650 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1904					*134000	104000	33100	11400	6560	8450			
1905					*101000	137000	41100	9000	*5250				
1906					162000	154000	62200	*10500					
1910				70900	101000	73800	12500	5470	6370	5350	4700	4580	
1911				44800	131000	142000	38000	9780	6260	21300	7930		
1912				*27900	161000	161000	82400	27400	9700	9780	10700		
1913				*51300	104000	85700	19300	6760	5710	6950	7080		
1914					*154000	151000	39600	11800	6820	14100	7200		
1915				47800	72500	93600	27700	6880	7370	7610	8100		
1916				71400	137000	139000	50100	17700	10300	16800	11100		
1917				6430	144000	227000	119000	22300	7740	5990	5880	5670	
1918	6760	5150	9410	38300	130000	176000	38200	7070	5080	26100	13900		

*Indicates estimates from partial month's records.

Run-Off in Acre-Feet of Williams River at Hamilton's.

Drainage Area, 341 Square Miles. Altitude, 6,400 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1904	....	....	....	....	61700	39700	10200	5350	3570	3750	....	....	....
1905	....	....	....	8030	45800	44300	7070	2860	2180	2680	....	....	....
1906	....	....	....	13000	82600	66600	14100	4820	4400	3270	....	....	....
1910	....	....	....	*25100	51600	34300	6210	3380	3690	3930	3450	....	....
1911	....	....	*5170	10200	45300	35300	7440	2690	2810	4910	*2740	....	....
1912	....	....	....	9050	55400	65000	23200	8510	4630	4890	4770	....	....
1913	....	....	....	28100	46100	19500	7560	4370	5830	4920	2260	....	....
1914	....	....	*4380	13500	63300	45300	11100	3960	3040	4960	3430	....	....
1915	....	....	....	17200	26700	25100	4820	2120	2740	2580	*2640	....	....
1916	....	....	*8180	16700	58800	52700	13500	6950	4430	6700	*4000	....	....
1917	....	....	....	*15800	75000	121000	36300	7990	4410	3800	3900	3940	....
1918	3750	3630	5690	9100	61500	56800	13700	3230	3490	3710	7020	....	....

Run-Off in Acre-Feet of Little Snake River at Dixon, Wyo.

Drainage Area, 1,294 Square Miles. Altitude, 6,344 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1910	....	....	....	....	....	39500	2110	1000	2280	4850	4580	....	....
1911	....	....	13400	49400	132000	90400	7200	758	1350	12200	6980	....	....
1912	....	....	....	31300	199000	173000	24600	4680	4560	9700	9220	....	....
1913	....	....	....	80300	116000	36400	3140	756	2180	5410	6130	....	....
1914	....	....	*9300	93300	256000	143000	12800	2640	2500	8930	6320	....	....
1915	....	....	....	....	97100	101000	5890	627	2470	4810	5690	....	....
1916	....	....	*42600	78600	152000	98800	11600	12200	5750	17300	10600	....	....
1917	....	....	....	71400	184000	240000	71300	7750	4010	5880	8090	....	....
1918	....	....	*19400	38900	172000	125000	10600	578	2070	6460	*7500	....	....

Run-Off in Acre-Feet of White River at Meeker.

Drainage Area, 634 Square Miles. Altitude, 6,182 Feet Above Sea Level.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1901	....	....	....	....	....	117000	44300	27900	21500	23100	....	....	....
1902	....	....	....	25800	119000	50400	25500	22900	23100	23800	....	....	....
1903	....	....	....	27300	103000	151000	50500	21600	27300	27600	....	....	....
1904	....	....	....	44400	108000	93400	34400	25400	24300	24800	....	....	....
1905	....	....	....	26100	91600	145000	35200	24900	22700	23100	....	....	....
1906	....	....	....	37400	129000	150000	51500	22900	20500	18000	....	....	....
1910	....	....	....	....	*69700	98500	26700	21800	21200	21600	19900	20600	....
1911	20800	18700	22800	35300	89800	109000	31700	19600	18500	27600	25500	....	....
1912	....	....	26800	23800	113000	175000	74800	28600	19600	21400	18800	....	....
1913	....	....	....	*32300	70800	67800	35400	21600	23200	21000	*14600	....	....
1914	....	....	....	....	111000	135000	44800	23700	17500	23700	....	....	....
1915	....	....	*19000	34000	54600	71600	27000	18100	19600	20900	19600	23300	....
1916	....	....	*25100	36800	89200	124000	49600	31800	25400	31300	20200	....	....
1917	....	....	*22500	26500	74400	184000	111000	36000	28400	27400	21200	28100	....
1918	21600	20100	24000	27100	91000	137000	42200	23500	19900	22300	21200	....	....

*Estimated from fractional month's records.

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